

PATENT COOPERATION TREATY

PCT

NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents
United States Patent and Trademark
Office
Box PCT
Washington, D.C.20231
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

Date of mailing (day/month/year) 13 July 2000 (13.07.00)	
International application No. PCT/NZ99/00188	Applicant's or agent's file reference JC 211099-142
International filing date (day/month/year) 10 November 1999 (10.11.99)	Priority date (day/month/year) 10 November 1998 (10.11.98)
Applicant VAN DYK, Antony, Keith et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

08 June 2000 (08.06.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No.: (41-22) 740.14.35	Authorized officer Claudio Borton Telephone No.: (41-22) 338.83.38
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PATENT COOPERATION TREATY

PCT

From the INTERNATIONAL BUREAU

NOTIFICATION CONCERNING THE FILING OF AMENDMENTS OF THE CLAIMS (PCT Administrative Instructions, Section 417)

To:

HAWKINS, Michael, Howard
Baldwin Shelston Waters
NCR Building
342 Lambton Quay
Wellington
NOUVELLE-ZÉLANDE

Date of mailing (day/month/year)	16 May 2000 (16.05.00)
Applicant's or agent's file reference	JC 211099-142
International application No.	PCT/NZ99/00188
International filing date (day/month/year)	10 November 1999 (10.11.99)
Applicant RESENE PAINTS LIMITED et al	

IMPORTANT NOTIFICATION

1. The applicant is hereby notified that amendments to the claims under Article 18 were received by the International Bureau on:

10 May 2000 (10.05.00)

2. This date is within the time limit under Rule 48.1.

Consequently, the international publication of the international application will contain the amended claims according to Rule 48.2(f), (h) and (i).

3. The applicant is reminded that the international application (description, claims and drawings) may be amended during the international preliminary examination under Chapter II, according to Article 34, and in any case, before each of the designated Offices, according to Article 28 and Rule 52, or before each of the elected Offices, according to Article 41 and Rule 78.

<p>The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland</p> <p>Facsimile No.: (41-22) 740.14.35</p>	<p>Authorised officer</p> <p>S. Cruz</p> <p>Telephone No.: (41-22) 328.83.38</p>
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Form PCT/IB/346 (September 1993)

3288017

PCT

REQUEST

The undersigned requests that the present international applications be processed according to the Patent Cooperation Treaty.

For Receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired) (12 characters maximum)
JC 211099-142

Box No. I TITLE OF INVENTION
AN IMPROVED METHOD OF PACKAGING SOLVENT OR WATER BASED FORMULATIONS

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

RESENE PAINTS LIMITED
32-50 Vogel Street
Naenae
Lower Hutt
New Zealand

☐ This person is also inventor.

Telephone No. 0064 4 5770500

Facsimile No. 0064 4 5773327

Teleprinter No.

State (i.e. country) of nationality: New Zealand

State (i.e. country) of residence: New Zealand

This person is applicant for the purposes of: ☐ all designated States ☒ all designated States except the United States of America ☐ the United States of America only ☐ the States indicated in the Supplemental Box

Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)

VAN DYK, Antony Keith
16 Memphis Grove
Totara Park
Upper Hutt
New Zealand

This person is

☐ applicant only

☒ applicant and inventor

☐ inventor only (If this check-box is marked, do not fill in below)

State (i.e. country) of nationality: New Zealand

State (i.e. country) of residence: New Zealand

This person is applicant for the purposes of: ☐ all designated States ☐ all designated States except the United States of America ☒ the United States of America only ☐ the States indicated in the Supplemental Box

☒ Further applicant and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as:

☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)

HAWKINS, Michael Howard

PAIRMAN, Jane Elizabeth

TERRY, John Kinnear

THOREAU, Philip Aubyn Bertram

ELLIOTT, Clive Lincoln

BALLANCE, Julie Anne

MONK, Jonathan Paul

JACKSON, Timothy Graham

LYTH, Richard John

BALDWIN SHELSTON WATERS
NCR Building
342 Lambton Quay
Wellington
NEW ZEALAND

Telephone No. (04) 472-1094

Facsimile No. (04) 494-0299

Teleprinter No. NZ 3918

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

Continuation of Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)

Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)</i> GOOCH, Colin 13 Akatarawa Road Upper Hutt New Zealand		This person is <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below)</i>
State (i.e. country) of nationality: British Subject	State (i.e. country) of residence: New Zealand	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box		
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)</i> 		This person is <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below)</i>
State (i.e. country) of nationality:	State (i.e. country) of residence:	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box		
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)</i> 		This person is <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below)</i>
State (i.e. country) of nationality:	State (i.e. country) of residence:	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box		
Name and address: <i>(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (i.e. country) of residence if no State of residence is indicated below.)</i> 		This person is <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only <i>(If this check-box is marked, do not fill in below)</i>
State (i.e. country) of nationality:	State (i.e. country) of residence:	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box		
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.		

Box No.V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes: at least one must be marked):

Regional Patent

- ☒ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SL Sierra Leone, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☒ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☒ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line):

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input checked="" type="checkbox"/> AE United Arab Emirates | <input checked="" type="checkbox"/> LS Lesotho |
| <input checked="" type="checkbox"/> AL Albania | <input checked="" type="checkbox"/> LT Lithuania |
| <input checked="" type="checkbox"/> AM Armenia | <input checked="" type="checkbox"/> LU Luxembourg |
| <input checked="" type="checkbox"/> AT Austria (and Utility Model) | <input checked="" type="checkbox"/> LV Latvia |
| <input checked="" type="checkbox"/> AU Australia | <input checked="" type="checkbox"/> MD Republic of Moldova |
| <input checked="" type="checkbox"/> AZ Azerbaijan | <input checked="" type="checkbox"/> MG Madagascar |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia |
| <input checked="" type="checkbox"/> BB Barbados | <input checked="" type="checkbox"/> MN Mongolia |
| <input checked="" type="checkbox"/> BG Bulgaria | <input checked="" type="checkbox"/> MW Malawi |
| <input checked="" type="checkbox"/> BR Brazil | <input checked="" type="checkbox"/> MX Mexico |
| <input checked="" type="checkbox"/> BY Belarus | <input checked="" type="checkbox"/> NO Norway |
| <input checked="" type="checkbox"/> CA Canada | <input checked="" type="checkbox"/> NZ New Zealand |
| <input checked="" type="checkbox"/> CH and LI Switzerland and Liechtenstein | <input checked="" type="checkbox"/> PL Poland |
| <input checked="" type="checkbox"/> CN China | <input checked="" type="checkbox"/> PT Portugal |
| <input checked="" type="checkbox"/> CU Cuba | <input checked="" type="checkbox"/> RO Romania |
| <input checked="" type="checkbox"/> CZ Czech Republic (and Utility Model) | <input checked="" type="checkbox"/> RU Russian Federation |
| <input checked="" type="checkbox"/> DE Germany (and Utility Model) | <input checked="" type="checkbox"/> SD Sudan |
| <input checked="" type="checkbox"/> DK Denmark (and Utility Model) | <input checked="" type="checkbox"/> SE Sweden |
| <input checked="" type="checkbox"/> EE Estonia (and Utility Model) | <input checked="" type="checkbox"/> SG Singapore |
| <input checked="" type="checkbox"/> ES Spain | <input checked="" type="checkbox"/> SI Slovenia |
| <input checked="" type="checkbox"/> FI Finland (and Utility Model) | <input checked="" type="checkbox"/> SK Slovakia (and Utility Model) |
| <input checked="" type="checkbox"/> GB United Kingdom | <input checked="" type="checkbox"/> SL Sierra Leone |
| <input checked="" type="checkbox"/> GD Grenada | <input checked="" type="checkbox"/> TJ Tajikistan |
| <input checked="" type="checkbox"/> GE Georgia | <input checked="" type="checkbox"/> TM Turkmenistan |
| <input checked="" type="checkbox"/> GH Ghana | <input checked="" type="checkbox"/> TR Turkey |
| <input checked="" type="checkbox"/> GM Gambia | <input checked="" type="checkbox"/> TT Trinidad and Tobago |
| <input checked="" type="checkbox"/> HR Croatia | <input checked="" type="checkbox"/> UA Ukraine |
| <input checked="" type="checkbox"/> HU Hungary | <input checked="" type="checkbox"/> UG Uganda |
| <input checked="" type="checkbox"/> ID Indonesia | <input checked="" type="checkbox"/> US United States of America |
| <input checked="" type="checkbox"/> IL Israel | |
| <input checked="" type="checkbox"/> IN India | |
| <input checked="" type="checkbox"/> IS Iceland | <input checked="" type="checkbox"/> UZ Uzbekistan |
| <input checked="" type="checkbox"/> JP Japan | <input checked="" type="checkbox"/> VN Viet Nam |
| <input checked="" type="checkbox"/> KE Kenya | <input checked="" type="checkbox"/> YU Yugoslavia |
| <input checked="" type="checkbox"/> KG Kyrgyzstan | <input checked="" type="checkbox"/> ZA South Africa |
| <input checked="" type="checkbox"/> KP Democratic People's Republic of Korea | <input checked="" type="checkbox"/> ZW Zimbabwe |
| <input checked="" type="checkbox"/> KR Republic of Korea | |
| <input checked="" type="checkbox"/> KZ Kazakhstan | |
| <input checked="" type="checkbox"/> LC Saint Lucia | <input checked="" type="checkbox"/> CR Costa Rica |
| <input checked="" type="checkbox"/> LK Sri Lanka | <input checked="" type="checkbox"/> DM Dominica |
| <input checked="" type="checkbox"/> LR Liberia | <input checked="" type="checkbox"/> TZ United Republic of Tanzania |
| | <input checked="" type="checkbox"/> MA Morocco |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

Precautionary Designation Statement: In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claims are indicated in the Supplemental Box		
Filing date of earlier application (day/month/year)	Number of earlier application	Where application is		
		national application: country	regional application: regional Office	international application: receiving Office
Item (1) 10 November 1998 (10.11.98)	NZ 332735	New Zealand		
Item (2)				
Item (3)				
<input checked="" type="checkbox"/> The receiving Office is hereby requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): (1)				
<small>*Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(i)). See Supplemental Box.</small>				
Box No. VII INTERNATIONAL SEARCHING AUTHORITY				
Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):		Request to use results of earlier search: reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):		
ISA/AU		Date (day/month/year)	Number	Country (or regional Office)
Box No. VIII CHECK LIST; LANGUAGE OF FILING				
This international application contains the following number of sheets:		This international application is accompanied by the item(s) marked below:		
request :	4	1. <input checked="" type="checkbox"/> fee calculation sheet		
description (excluding sequence listing part)	15	2. <input type="checkbox"/> separate signed power of attorney		
claims :	6	3. <input type="checkbox"/> copy of general power of attorney; reference number, if any:		
abstract :	1	4. <input type="checkbox"/> statement explaining lack of signature;		
drawings :	3	5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s);		
sequence listing part of description		6. <input type="checkbox"/> translation of international application into (language);		
Total number of sheets:	29	7. <input type="checkbox"/> separate indications concerning deposited microorganism or other biological material		
		8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form		
		9. <input type="checkbox"/> other (specify):		
Figure of the drawings which should accompany the abstract: 1		Language of filing of the International application: English		
Box No. IX SIGNATURE OF APPLICANT OR AGENT				
Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).				
BALLANCE, Julie Anne as Agent				

For receiving Office use only		2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:		
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA/	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid	
For International Bureau use only		
Date of receipt of the record copy by International Bureau:		

PCT

FEE CALCULATION SHEET
Annex to the Request

For receiving Office use only

International Application

Date stamp of the receiving Office

Applicant's or Agent's
reference: JC211099-142

Applicant: RESENE PAINTS LIMITED

CALCULATION OF PRESCRIBED FEES

TRANSMITTAL FEE \$180.00 ☐ TSEARCH FEE \$ 910.00 ☐ SInternational search to be carried out by AU

(Two or more International Searching Authorities are competent in relation the international application, indicate the name of the Authority which is chosen to carry out the international search.)

INTERNATIONAL FEE

Basic Fee

The international application contains 29 sheets.

First 30 sheets

850.00 ☐ b₁20.00 =
remaining sheets additional amount0.00 ☐ b₂Add amounts entered at b₁ and b₂ and enter total at B 850.00 ☐ B

Designation Fees

The international application contains 104 designations.

maximum x \$196.00 \$1.960.00 ☐ D
Number of designation amount of designation fee
fees payable (maximum 10)Add amounts entered at B and D and enter total at I 2,810.00 ☐ IFEE FOR PRIORITY DOCUMENT 30.00 ☐ P

TOTAL FEES PAYABLE

Add amounts entered at T, S, I and P, and enter total in TOTAL box 3,930.00
TOTAL☐ The designation fees are not paid at this time.

MODE OF PAYMENT

☐ authorization to charge
deposit account (see below)☐ bank draft☐ coupons☒ cheque☐ cash☐ other (specify)☐ postal money order☐ revenue stamps

DEPOSIT ACCOUNT AUTHORIZATION (this mode of payment may not be available at all receiving Offices)

The RO/ ☐

is hereby authorized to charge the total fees indicated above to my deposit account.

☐

is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account.

☐

is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.

Deposit Account Number

Date (day/month/year)

Signature

The demand must be filed directly with the competent International Preliminary Examining Authority or, if two or more Authorities are competent, with one chosen by the applicant. The full name or letter code of that Authority may be indicated by the applicant on the form below:

IPEA/AU _____

PCT

CHAPTER II

DEMAND

under Article 31 of the Patent Cooperation Treaty:
The undersigned requests that the international application specified below be the subject of international preliminary examination according to the Patent Cooperation Treaty and hereby elects all eligible States (except where otherwise indicated).

For International Preliminary Examining Authority use _____

Identification of IPEA		Date of receipt of DEMAND
Box No. I IDENTIFICATION OF THE INTERNATIONAL APPLICATION		Applicant's or agent's file reference JC 211099/142
International application No. PCT/NZ99/00188	International filing date (day/month/year) 10 November 1999 (10.11.99)	(Earliest) Priority date (day/month/year) 10 November 1998 (10.11.98)
Title of invention METHOD OF PACKAGING SOLVENT OR WATER BASED FORMULATIONS TO REDUCE SKINNING		
Box No. II APPLICANT(S)		
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country) RESENE PAINTS LIMITED 32-50 Vogel Street Naenae Lower Hutt NEW ZEALAND		Telephone No. (04) 577-0550 Facsimile No. (04) 577-0664 Teleprinter No.
State (i.e. country) of nationality: New Zealand		State (i.e. country) of residence: New Zealand
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)		
State (i.e. country) of nationality:		State (i.e. country) of residence:
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)		
State (i.e. country) of nationality:		State (i.e. country) of residence:
<input type="checkbox"/> Further applicants are indicated on a continuation sheet.		

Box No. III AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCEThe following person is ☒ agent ☐ common representativeand ☒ has been appointed earlier and represents the applicant(s) also for international preliminary examination.☐ is hereby appointed and any earlier appointment of (an) agent(s)/common representative is hereby revoked.☐ is hereby appointed, specifically for the procedure before the International Preliminary Examination Authority, in addition to the agent(s)/common representative appointed earlier.Name and address: *(Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)*

HAWKINS, Michael Howard;

PAIRMAN, Jane Elizabeth

THOREAU, Philip Aubyn Bertram

LYNCH, Gregory Paul

ELLIOTT, Clive Lincoln

SUTTON, Angela Aitchison

TERRY, John Kinnear

BALLANCE, Julie Anne

MONK, Jonathan Paul

BALDWIN SHELSTON WATERS

JACKSON, Timothy Graham

NCR Building, 342 Lambton Quay

LYTH, Richard John

WELLINGTON 6001

NEW ZEALAND

Telephone No. (04) 472-1094

Facsimile No. (04) 494-0299

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent**Box No. IV STATEMENT CONCERNING AMENDMENTS****Statement concerning amendments***

1. The applicant wishes the international preliminary examination to start on the basis of:

☐ the international application as originally filedthe description ☒ as originally filed☐ as amended under Article 34the claims ☐ as originally filed☒ as amended under Article 19 (together with any accompanying statement)☐ as amended under Article 342. ☐ The applicant wishes any amendment to the claims under Article 19 to be considered as reversed.3. ☐ The applicant wishes the start of the international preliminary examination to be postponed until the expiration of 20 months from the priority date unless the International preliminary Examining Authority receives a copy of any amendments made under Article 19 or a notice from the applicant that he does not wish to make such amendments (Rule 69.1(d)). *(This check-box may be marked only where the time limit under Article 19 has not yet expired).*

* Where no check-box is marked, international preliminary examination will start on the basis of the international application as originally filed or, where a copy of amendments to the claims under Article 19 and/or amendments of the international application under Article 34 are received by the International Preliminary Examining Authority before it has begun to draw up a written opinion or the international preliminary examination report, as so amended.

Language for the purposes of international preliminary examination:☐ which is the language in which the international application was filed.☐ which is the language of a translation furnished for the purposes of international search.☐ which is the language of publication of the international application.☐ which is the language of the translation (to be) furnished for the purposes of international preliminary examination.**Box No. V ELECTION OF STATES**The applicant hereby elects all eligible States *(that is, all States which have been designated and which are bound by Chapter II of the PCT)*

excluding the following states which the applicant wishes not to elect:

Box No. VI CHECK LIST

The demand is accompanied by the following elements, in the language referred to in Box No. IV, for the purposes of international preliminary examination:

- | | | | |
|--|---|---|--------|
| 1. Translation of international application | : | | sheets |
| 2. amendments under Article 34 | : | | sheets |
| 3. copy (or, where required, translation) of amendments under Article 19 | : | 7 | sheets |
| 4. copy (or, where required, translation) of statement under Article 19 | : | 0 | sheets |
| 5. letter | : | | sheets |
| 6. other (<i>specify</i>) | : | | sheets |

For International Preliminary Examining Authority use only

received	not received
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- | | |
|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> | <input type="checkbox"/> |

The demand is also accompanied by the item(s) marked below:

- | | |
|--|--|
| 1. <input checked="" type="checkbox"/> fee calculation sheet | 4. <input type="checkbox"/> statement explaining lack of signature |
| 2. <input type="checkbox"/> separate signed power of attorney | 5. <input type="checkbox"/> Nucleotide and/or amino acid sequence listing in computer readable form) |
| 3. <input type="checkbox"/> copy of general power of attorney; reference number, if any: | 6. <input type="checkbox"/> other (<i>specify</i>): |

Box No. VII SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the demand).

Julie Anne Ballance

For International Preliminary Examining Authority Use Only

1. Date of actual receipt of DEMAND:
2. Adjusted date of receipt of demand due to CORRECTIONS under Rule 60.1(b):
3. ☐ The date of receipt of the demand is AFTER the expiration of 19 months from the priority date and item 4 or 5, below, does not apply. ☐ The applicant has been informed accordingly
4. ☐ The date of receipt of the demand is WITHIN the period of 19 months from the priority date as extended by virtue of Rule 80.5.
5. ☐ Although the date of receipt of the demand is after the expiration of 19 months from the priority date, the delay in arrival is EXCUSED pursuant to Rule 82.

For International Bureau Use Only

Demand received from IPEA on:

PCT

CHAPTER II

FEE CALCULATION SHEET

Annex to the Demand for international preliminary examination

International application No.: PCT/NZ99/00188		For International Preliminary Examining Authority Use Only	
Applicant's or Agent's File reference: JC 211099/142		Date stamp of the IPEA	
Applicant RESENE PAINTS LIMITED			
Calculation of Prescribed Fees			
1. Preliminary examination fee	A\$450.00	P	
2. Handling fee <i>(Applicants from certain States are entitled to a reduction of 75% of the handling fee. Where the applicant is (or all applicants are) so entitled, the amount to be entered at H is 25% of the handling fee.)</i>	A\$238.00	H	
3. Total of prescribed fees Add the amounts entered at P and H and enter total in the TOTAL box	A\$688.00		
		TOTAL	
Mode of Payment			
<input type="checkbox"/> authorization to charge deposit account with the IPEA (see below)	<input type="checkbox"/> bank draft	<input type="checkbox"/> coupons	
<input checked="" type="checkbox"/> cheque	<input type="checkbox"/> cash	<input type="checkbox"/> other (specify)	
<input type="checkbox"/> postal money order	<input type="checkbox"/> revenue stamps		
Deposit Account Authorization <i>(this mode of payment may not be available at all IPEAs)</i>			
The IPEA/AU	<input type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account.		
	<input type="checkbox"/> <i>(this check-box may be marked only if the conditions for deposit accounts of the IPEA so permit)</i> is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account		
Deposit Account Number	Date (day/month/year)	Signature	

From the INTERNATIONAL ARCHIVING AUTHORITY

BALDWIN SHELSTON WATERS
PO Box 852
WELLINGTON 6001
New Zealand

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL SEARCH REPORT
OR THE DECLARATION

Date of mailing
(day/month/year)

22 MAR 2000

FOR FURTHER ACTION See paragraphs 1 and 4 below

International filing date

10 November 1999

RESENE PAINTS LIMITED

1. ☒ The applicant is hereby notified that the international search report has been established and is transmitted herewith

The applicant is entitled, if he so wishes, to amend the claims of the international application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the international search report, however, for more details, see the notes on the accompanying sheet.

Where? Directly to the International Bureau of WIPO
34, chemin des Colombettes
1211 Geneva 20, Switzerland
Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.

2. ☐ The applicant is hereby notified that no international search report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after 18 months from the priority date, the international application will be published by the International Bureau.

If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within 19 months from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later)

Within 20 months from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the ISA/AU

AUSTRALIAN PATENT OFFICE
 PO BOX 200, WODEN ACT 2606, AUSTRALIA
 E-mail address: pct@ipaustalia.gov.au
 Facsimile No. (02) 6285 3929

Authorized officer _____

DEREK BUTLER

Telephone No. (02) 6283 2347

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasised that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, eg. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequences if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicants Guide*, Volume II.

PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference JC 211099-142	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/NZ99/00188	International filing date (day/month/year) 10 November 1999	(Earliest) Priority Date (day/month/year) 10 November 1998
Applicant RESENE PAINTS LIMITED et al		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 5 sheets.

☐ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title, ☐ the text is approved as submitted by the applicant.

☒ the text has been established by this Authority to read as follows:

Method of Packaging Solvent or Water Based Formulations to Reduce Skinning

5. With regard to the abstract, ☐ the text is approved as submitted by the applicant

☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. 1

☒ as suggested by the applicant

☐ None of the figures

☐ because the applicant failed to suggest a figure

☐ because this figure better characterizes the invention

Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The present invention relates to packaging water or solvent based formulations, in particular to those formulations which are prone to skinning. The invention comprises a container (1) that is adapted to contain such a formulation (4) in which an anti-skinning layer (6) is located between at least a portion of an internal surface of the container (1) or a lid (5) and the formulation (4).

INTERNATIONAL SEARCH REPORT

International application No.
PCT/NZ99/00188

A. CLASSIFICATION OF SUBJECT MATTER												
Int. Cl. ¹ : B65D 81/24, 43/02, B44D 3/12												
According to International Patent Classification (IPC) or to both national classification and IPC												
B. FIELDS SEARCHED												
Minimum documentation searched (classification system followed by classification symbols) IPC B44D 3/12, B65D 25/14, 43/00, 43/02, 51/24, 53/-, 81/18, 81/24, 81/38, 85/72, 90/04, 90/06, 90/38												
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched AU IPC B44D 3/12, 43/00, 43/02, 81/18, 81/24												
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) WPAT												
C. DOCUMENTS CONSIDERED TO BE RELEVANT												
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.										
X	US 4625883 A (BURKE et al) 2 December 1986 Whole document, particularly figure 4	1, 6-9, 14, 16-19, 26, 27, 31, 33, 34										
X	US 5249692 A (GUNDERSON) 5 October 1993 Whole document	1, 6-9, 14-19, 26, 27, 31-34										
X	US 5305909 A (MERRITT) 26 April 1994 Whole document	1, 6-9, 16-21, 26, 27, 31, 34										
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C <input checked="" type="checkbox"/> See patent family annex												
<p>* Special categories of cited documents:</p> <table border="0"> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"E" earlier application or patent but published on or after the international filing date</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td>"&" document member of the same patent family</td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> </tr> </table>			"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone	"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art	"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family	"P" document published prior to the international filing date but later than the priority date claimed	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention											
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone											
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art											
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family											
"P" document published prior to the international filing date but later than the priority date claimed												
Date of the actual completion of the international search 16 March 2000		Date of mailing of the international search report 22 MAR 2000										
Name and mailing address of the ISA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929		Authorized officer DEREK BUTLER Telephone No.: (02) 6283 2347										

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ99/00188

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4691838 A (GRAHAM et al) 8 September 1987 Whole document	1, 3, 6-8, 16-19, 26
X	GB 2306429 A (ALLBRIGHTON) 7 May 1997 Whole document	1, 6-8, 16, 18, 19, 26

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/NZ99/00188

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	4625883						
US	5249692						
US	5305909						
US	4691838	AU	36615/84	CA	1247560	EP	151876
		NZ	210570	ZA	8409748		
GB	2306429						
END OF ANNEX							

PATENT COOPERATION TREATY

From the:
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

BALDWIN SHELSTON WATERS
PO Box 852
WELLINGTON 6001
New Zealand

RECEIVED
- 4 JAN 2001
Per... *RIE*

PCT NOTIFICATION OF TRANSMITTAL OF INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing
day/month/year

21 DEC 2000

Applicant's or agent's file reference
JC211099-142

IMPORTANT NOTIFICATION

International Application No.
PCT/NZ99/00188

International Filing Date
10 November 1999

Priority Date
10 November 1998

Applicant

RESENE PAINTS LIMITED et al

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translations to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices)(Article 39(1))(see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide

Name and mailing address of the IPEA/AU
AUSTRALIAN PATENT OFFICE
PO BOX 200, WODEN ACT 2606, AUSTRALIA
E-mail address: pct@ipaaustralia.gov.au
Facsimile No. (02) 6285 3929

Authorized officer

DEREK BUTLER
Telephone No. (02) 6283 2347

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference C211099-142	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. CT/NZ99/00188	International Filing Date (day/month/year) 10 November 1999	Priority Date (day/month/year) 10 November 1998
International Patent Classification (IPC) or national classification and IPC Int. Cl. ⁷ B65D 81/24, 43/02, B44D 3/12		
Applicant RESENE PAINTS LIMITED et al		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 3 sheets, including this cover sheet.
- ☒ This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 23 sheet(s).

3. This report contains indications relating to the following items:

- | | |
|------|---|
| I | <input checked="" type="checkbox"/> Basis of the report |
| II | <input type="checkbox"/> Priority |
| III | <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| IV | <input type="checkbox"/> Lack of unity of invention |
| V | <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| VI | <input type="checkbox"/> Certain documents cited |
| VII | <input type="checkbox"/> Certain defects in the international application |
| VIII | <input type="checkbox"/> Certain observations on the international application |

Date of submission of the demand 8 June 2000	Date of completion of the report 7 December 2000
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaustalia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer DEREK BUTLER Telephone No. (02) 6283 2347

Basis of the report

With regard to the elements of the international application:*

- ☐ the international application as originally filed.
- ☒ the description, pages , as originally filed,
Pages , filed with the demand;
pages 1-16, received on 10 November 2000 with the letter of 10 November 2000
- ☒ the claims, pages , as originally filed,
pages , as amended (together with any statement) under Article 19,
pages , filed with the demand,
pages 17-23, received on 10 November 2000 with the letter of 10 November 2000
- ☒ the drawings, pages 1-3, as originally filed,
pages , filed with the demand,
pages , received on with the letter of
- ☐ the sequence listing part of the description:
pages , as originally filed
pages , filed with the demand
pages , received on with the letter of

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, was on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Statement

Novelty (N)	Claims 1-51	YES
	Claims -	NO
Inventive step (IS)	Claims 1-51	YES
	Claims -	NO
Industrial applicability (IA)	Claims 1-51	YES
	Claims -	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

- D1 US 4625883 (BURKE et al)
- D2 US 5249692 (GUNDERSON)
- D3 US 5305909 (MERRIT)
- D4 US 4691838 (GRAHAM et al)
- D5 GB 2306429 (ALLBRIGHTON)

NOVELTY (N) and INVENTIVE STEP (IS) claims 1-51

The claims define a water or solvent based formulation container or container sealing means that includes an anti-skinning layer located on at least a portion of the internal surface of the container or sealing means, the anti-skinning layer being capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation. The claims also define a method of preventing skin formation on water or solvent based formulations using a container including such an anti-skinning layer.

None of the documents identified in the International Search Report, either individually or considered together, disclose or obviously suggest to a person skilled in the art, an anti-skinning layer located on at least a portion of the internal surface of the container wherein the anti-skinning layer is capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation.

D1 to D5 disclose anti-skinning devices located on a portion of the inner surface of a container or lid and on the formulation, the materials used being capable of retaining a layer of the formulation, but they each disclose devices comprising material that specifically limits any vapour in the container from contacting the formulation.

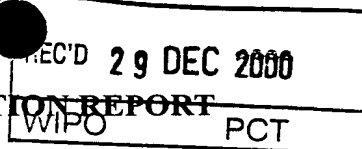
Therefore the subject matter of these claims is new and not obvious and meets the requirements of Articles 33(2) and (3) of the PCT with regard to novelty and inventive step.

INDUSTRIAL APPLICABILITY (IA) claims 1-51

The subject matter of the claims can be made or used in industry and therefore meets the requirements of Article 33(4) with regard to industrial applicability.

15

PATENT COOPERATION TREATY
PCT
INTERNATIONAL PRELIMINARY EXAMINATION REPORT
(PCT Article 36 and Rule 70)



Applicant's or agent's file reference JC211099-142	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416).
International Application No. PCT/NZ99/00188	International Filing Date (<i>day/month/year</i>) 10 November 1999	Priority Date (<i>day/month/year</i>) 10 November 1998
International Patent Classification (IPC) or national classification and IPC Int. Cl.⁷ B65D 81/24, 43/02, B44D 3/12		
Applicant RESENE PAINTS LIMITED et al		

1.	This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2.	This REPORT consists of a total of 3 sheets, including this cover sheet. <input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e., sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT). These annexes consist of a total of 23 sheet(s).
3.	This report contains indications relating to the following items: I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application

Date of submission of the demand 8 June 2000	Date of completion of the report 7 December 2000
Name and mailing address of the IPEA/AU AUSTRALIAN PATENT OFFICE PO BOX 200, WODEN ACT 2606, AUSTRALIA E-mail address: pct@ipaaustralia.gov.au Facsimile No. (02) 6285 3929	Authorized Officer DEREK BUTLER Telephone No. (02) 6283 2347

I. Basis of the report

1. With regard to the **elements** of the international application:*
- ☐ the international application as originally filed.
- ☒ the description, pages , as originally filed,
 Pages , filed with the demand,
 pages **1-16**, received on **10 November 2000** with the letter of **10 November 2000**
- ☒ the claims, pages , as originally filed,
 pages , as amended (together with any statement) under Article 19,
 pages , filed with the demand,
 pages **17-23**, received on **10 November 2000** with the letter of **10 November 2000**
- ☒ the drawings, pages **1-3**, as originally filed,
 pages , filed with the demand,
 pages , received on with the letter of
- ☐ the sequence listing part of the description:
 pages , as originally filed
 pages , filed with the demand
 pages , received on with the letter of
2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.
These elements were available or furnished to this Authority in the following language which is:
- ☐ the language of a translation furnished for the purposes of international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of the translation furnished for the purposes of international preliminary examination (under Rules 55.2 and/or 55.3).
3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, was on the basis of the sequence listing:
- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished
4. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/fig.
5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).**

* Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17).

** Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

Novelty (N)	Claims 1-51	YES
	Claims -	NO
Inventive step (IS)	Claims 1-51	YES
	Claims -	NO
Industrial applicability (IA)	Claims 1-51	YES
	Claims -	NO

2. Citations and explanations (Rule 70.7)

The following documents identified in the International Search Report have been considered for the purposes of this report:

- D1 US 4625883 (BURKE et al)
- D2 US 5249692 (GUNDERSON)
- D3 US 5305909 (MERRIT)
- D4 US 4691838 (GRAHAM et al)
- D5 GB 2306429 (ALLBRIGHTON)

NOVELTY (N) and INVENTIVE STEP (IS) claims 1-51

The claims define a water or solvent based formulation container or container sealing means that includes an anti-skinning layer located on at least a portion of the internal surface of the container or sealing means, the anti-skinning layer being capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation. The claims also define a method of preventing skin formation on water or solvent based formulations using a container including such an anti-skinning layer.

None of the documents identified in the International Search Report, either individually or considered together, disclose or obviously suggest to a person skilled in the art, an anti-skinning layer located on at least a portion of the internal surface of the container wherein the anti-skinning layer is capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation.

D1 to D5 disclose anti-skinning devices located on a portion of the inner surface of a container or lid and on the formulation, the materials used being capable of retaining a layer of the formulation, but they each disclose devices comprising material that specifically limits any vapour in the container from contacting the formulation.

Therefore the subject matter of these claims is new and not obvious and meets the requirements of Articles 33(2) and (3) of the PCT with regard to novelty and inventive step.

INDUSTRIAL APPLICABILITY (IA) claims 1-51

The subject matter of the claims can be made or used in industry and therefore meets the requirements of Article 33(4) with regard to industrial applicability.

METHOD OF PACKAGING
SOLVENT OR WATER BASED FORMULATIONS TO REDUCE SKINNING

Field of the Invention

5

The present invention relates generally to a method of packaging water or solvent based formulations, such as paints, resins and glues. In particular the present invention relates to a method of packaging such formulations which minimises skinning of the formulation on the internal surfaces of
10 containers in which the formulation is stored.

Background

It is known to store water-based or solvent based formulations in containers.
15 Such containers have a lid or sealing means to isolate the formulation from the surrounding atmosphere.

Commercially available paints are generally stored in a number of different sized containers. The container size may range from ten millilitres through to
20 50,000 litres.

Paint containers which contain approximately 1 litre through to 50,000 litres of a paint formulation are vulnerable to the forming of a skin on the internal surfaces of the container upon storage. The skin is a film of paint which is in
25 contact with the lid and typically the upper internal side of the paint container. The skinning of paints in paint containers is a recognised problem in the industry and occurs in containers made out of plastics or metals. If the skinning is quite considerable it may be necessary in some instances to sieve the paint formulation to remove the skin prior to using the paint.

30

Skinning on the surface of solvent based (alkyd) paint has been known for many decades. The mechanism is known to involve the uptake of oxygen

leading to the oxidative cross-linking (skinning) of the paint. There are various additives that are known which can be used in alkyd paints to inhibit premature crosslinking.

- 5 Typically, volatile oximes are used to chelate to the polymerisation catalysts (typically transition metals, such as cobalt, salts of organic acids such as octanoic acid or naphthenic acid) and inhibit the activity in the wet state. Methyl ethyl ketoxime is commonly used as an anti skin additive in alkyd paints.

10

Otherwise, means or methods of preventing or reducing skinning of paints in containers are unknown, other than the impractical and hazardous method of excluding the formulation vapour from the containers.

- 15 The skinning of paint is particularly pronounced when paint containers are stored under varying external temperature conditions. The occurrence of skinning has been found to be more prevalent during the warmer conditions of summer.

- 20 It is an object of the present invention to alleviate some of the skinning difficulties experienced in the paint industry, or to at least provide the public with a useful choice.

- 25 The terms "anti-skinning" and "prone to skinning" as used throughout this specification are to be construed to include instances of skinning that occur by water or solvent loss from the formulation. These terms are not to be construed to include instances of skinning involving the uptake of oxygen leading to the oxidative cross-linking of the formulation.

- 30 **Summary of the Invention**

The present invention provides a container, which is adapted to contain a water based or solvent based formulation, the container including

- an anti-skinning layer located on at least a portion of the internal surface of the container and the formulation, wherein the anti-skinning layer is capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation.
- Preferably, the anti-skinning layer substantially maintains the water or solvent concentration of a portion of the formulation retained on the anti-skinning layer.
- Preferably, the anti-skinning layer is textured, porous, fibrous, filamentous, a gauze, or foam lining.
- Preferably, the anti-skinning layer additionally has insulative properties.
- Preferably, the anti-skinning layer is integrally moulded into the internal surface of the container.
- Preferably, the container contains approximately 10 ml to 50,000 litres of formulation.
- Preferably, the water based or solvent based formulation is a formulation prone to skinning, such as a latex based paint, an alkyd paint, a flat, a satin, a semi-gloss or a gloss paint, a varnish, a lacquer, a glue or resin such as PVA™, a resin emulsion or a water based ink.
- In another aspect the present invention provides a container, which is adapted to contain a water based or solvent based formulation, the container including

- a container sealing means including an anti-skinning layer located on at least a portion of the internal surface of the sealing means, wherein the anti-skinning layer is capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation.

Preferably, the anti-skinning layer substantially maintains the water or solvent concentration of a portion of the formulation retained on the anti-skinning layer.

Preferably, the anti-skinning layer is textured, porous, fibrous, filamentous a gauze, or foam lining.

Preferably, the anti-skinning layer additionally has insulative properties.

Preferably, the anti-skinning layer is located on the internal surface of the sealing means and integrally moulded with the container sealing means.

Preferably, the container contains approximately 10 ml to 50,000 litres of formulation, and the sealing means is a resealable lid.

In another aspect of the present invention there is provided a container adapted to contain a water based or solvent based formulation and a container sealing means as described above, the container being further adapted to include a second anti-skinning layer on the internal surface of the container.

Preferably, the second anti-skinning layer is textured.

Preferably, the second anti-skinning layer is integrally moulded into the container.

Preferably, the second anti-skinning layer is located between the circumferential lip of the container and the formulation.

- 5 Preferably, the second anti-skinning layer is an integrally moulded series of spaced apart concentric ribs moulded into a plastics container between the top of the container proximate the sealing means to at least the formulation level.
- 10 Preferably, the texturing extends at least 1 -10 microns (0.001 - 0.01mm) from the internal surface of the container.

In a further aspect of the present invention there is provided a method of preventing skin formation on a water based or solvent based formulation, the
15 method including the steps of

- placing the water based or solvent based formulation in a container as described above, and
- 20 - storing or transporting the formulation.

Preferably, the anti-skinning layer is textured, having insulative properties and is located proximate the internal surface of the sealing means.

- 25 Preferably, the container contains between 10 ml to 50,000 litres of formulation, and the sealing means is a resealable lid.

In a further aspect of the present invention there is provided a sealing means, the sealing means being adapted to substantially control skinning of water
30 based or solvent based formulations, in which the sealing means includes an anti-skinning layer in which the layer is located on at least a portion of the inner surface of the sealing means, wherein the antiskinning layer when in

use on a container is adapted to contain a water-based or solvent based formulation, is capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation.

5

Preferably, the anti-skinning layer is approximately 0.001 millimetres to 5 centimetres thick, is textured and is located on the internal surface of the sealing means.

- 10 Preferably, the anti-skinning layer covers substantially the entire surface area of the internal surface of the sealing means, and the sealing means is a resealable lid.

- 15 In a further aspect the present invention provides a container including a sealing means, in which the container is adapted to contain a formulation prone to skinning by loss of water or solvent, wherein at least a portion of the internal surface of the container in proximity with the ullage space of the container has a means of retaining a layer of the formulation, without excluding the formulation vapour in the container from contacting the
20 formulation.

Preferably, the means is a textured anti-skinning layer from 0.001 to 5 mm thick, which substantially covers the internal surface of the sealing means.

- 25 Preferably, the anti-skinning layer is porous, has insulative properties and is integrally moulded onto the internal surface of the sealing means.

- Preferably, the anti-skinning layer is selected from a group consisting of woven or unwoven polyolefin cloth or gauze, artificial grass matting and
30 glass fibre felt and is thermally bonded to a plastics sealing means.

The term "insulative properties", as used in this specification with reference to the anti-skinning layer, is used to refer to a layer that has the properties of reducing temperature and concentration differentials within the container interior, and modulating heat transfer between the environment and the container interior.

Further aspects of the present invention will become apparent from the following description given by way of example and with reference to any one of the following figures, in which:

10

Figure 1 illustrates a container adapted to contain a water or solvent based formulation and a lid means comprising a lid liner.

15

Figure 2 illustrates the internal surface of a lid means including a lid liner.

Figure 3 illustrates a textured pattern on the internal surface of a lid.

20

Figure 4 illustrates an alternative textured pattern on the internal surface of a lid.

Detailed Description of the Invention

A solvent or water based formulation container 1 is illustrated in Figure 1. The container preferably, comprises substantially upright walls 2 and a base means 3. A water based or solvent based formulation 4 is contained within the container. Preferably, the formulation substantially fills the container. The container may be adapted to contain approximately 10 ml to 50,000 litres of formulation 4.

30 A sealing means or lid 5 is adapted to cover the formulation 4 in the container 1 and to substantially exclude ingress of the external atmosphere into the internal compounds of the container and loss of the internal

atmosphere out of the container. Preferably, the container lid is adapted to be substantially airtight when located securely on the container.

An internal surface layer or lining 6 located on the lid is illustrated in Figure 1. The layer or lining 6, preferably substantially covers the entire internal surface of the lid means. In some instances there may be an ullage or space 7, between the formulation 4 and the lid liner 6. The internal surface of the container 8 can be either in contact with the formulation or in contact with the vapour of the formulation as shown in Figure 1.

In Figure 2 the inner surface of the lid 5 is illustrated with a covering liner 6.

During storage of containers of formulations of solvent or water based mixtures, the container 2, the formulation 4, the ullage 7 and the lid means 5 all form part of a system which is vulnerable to temperature changes. When the surrounding environment of the container is constant, the temperatures of the container, the formulation and the ullage space is substantially equal to the temperature of the external environment. The vapour arising from the formulation is maintained in the ullage space between the internal surface of the lid and the body of the formulation. It has been established that no skinning occurs under conditions whereby the temperature of the container, the body of the formulation and ullage space are at equilibrium. To maintain such a temperature equilibrium from the time of filling the container to storage and ultimately to the time just prior to the use of the formulation would require very expensive atmospheric control means.

However, when the temperature of the external environment increases, for example, where the container is sitting in sunlight, the external surface of the container and lid can increase while the corresponding temperature of the formulation within the container, the vapour in the ullage 7, and the lid surface can be substantially different. The temperature of the lid 5 and the adjacent formulation vapour in the ullage 7 increases in temperature more

quickly than the body of the formulation 4. A temperature gradient may be created between the lid and the body of the formulation.

It has been established that under conditions of storage of containers 1
5 where the temperature of the external atmosphere is not maintained at a steady state, the formulation has a tendency to skin proximate to the lid of the container. This is thought to arise because of the temperature gradient and thereby concentration gradient of vapour existing between the lid and the formulation.

10 In a closed and substantially watertight container there is only limited scope for the drying of paint. Under equilibrium conditions the air in the ullage space 7 is saturated with a concentration of water or solvent vapour, which depends on the composition of the paint or formulation. Generally, for a
15 water based formulation the concentration of water vapour is above 90%. Skinning of paint does not normally occur under these conditions. It has been established that pails of paint stored at $25 \pm 2^\circ\text{C}$ for 3 months have not skinned. However, pails of the same paint skinned, when subjected to a single heating cycle exceeding about 5°C . It has been found that the greater
20 the heating step, the greater the degree of skinning.

The temperature gradients create concentration gradients of water or solvent vapour. The air proximate to the layer of formulation on the lid becomes dry when the lid is heated and water is lost from the layer of paint.

25 In typical storage conditions it is difficult and expensive to maintain temperature to within one or two degrees Centigrade. However the issue is the rate of change of temperature, where sudden changes are worse than gradual changes. Lids are prone to skinning because they have only weak
30 thermal coupling to the body of paint, the main heat reservoir. Lids are forced to follow ambient temperatures, while the paint in the body of the

container responds more sluggishly to temperature changes. Metal
containers have better thermal conduction properties than do typical plastic
containers. Temperature differentials are generally less for metal containers
than they are for plastic containers. Metal containers are known to be less
5 prone to skinning.

While the mechanism of skinning is as discussed there are two additional
aspects. One is that by retaining a thicker layer of paint on the inner surface
of container there is better thermal coupling to the body of paint. This acts
10 to reduce the temperature differential that occurs between the lid and the
body of paint or formulation. Some paints are inherently thicker than others
and will naturally form thicker films which are less prone to skinning under
these conditions. Another aspect of the mechanism is that the evaporation
of water or solvent vapour from the paint acts to carry away heat, which
15 also acts to reduce the temperature differential. Both these additional
effects are only effective as long as the layer of paint remains substantially
fluid. By retaining a thicker layer of paint, and thereby a greater
concentration of water or solvent proximate the inner surfaces of both the
container, around the ullage space, and proximate the internal surface of the
20 lid, the time of wetness is prolonged compared to that observed with
conventional lid surfaces. This provides a method of extended
thermodynamic cooling because of evaporation of the water or solvent from
the thicker layer of retained formulation.
Additionally, it is thought that the thermal conductivity is greater between
25 the lid and thicker layer of retained formulation and the bulk of the
formulation.

In order to minimise the concentration and temperature gradient arising under
conditions whereby the external temperature of the container 1 is not
30 maintained at a constant value, it has been found that the incorporation of a
textured, porous, fibrous, filamentous, gauze or foam-like layer of
approximately 0.001 to 5 mm either suspended between the lid and

formulation or located on or integrated with the internal surface of the lid can control skinning. The results of a particular experiment illustrating the effects of the skinning control measures achieved from various linings are illustrated in the following examples.

5

Example 1 – Pails of water based high solids acrylic undercoat were placed in an incubator at 40°C for one day. The initial temperature of the containers was conditioned to 24°C. The container contained 10 litres of formulation. A container, comprising a non-lined lid was used as a reference.

10 The amount of skin formed in the reference container was 11.2 grams. The degree of skinning was determined by removing the skin off the lid with a soft brush under water into a 500 µm test sieve. The skin which was collected was spun dry, weighed and bottled for future reference.

15 The lid liners that were compared are illustrated in the following table.

	<u>Lid Lining Means</u>	<u>Skin Percentage</u>
	Untreated container (reference)	100%
	Plastic sheet lid liner ¹	38%
20	Container insulation ²	22%
	Internal polystyrene float	17%
	Fibreglass gauze on lid	3%

¹ The single ply plastic sheet tested was 75 micron polyethylene, 75g per square metre per ply.

² Insulation means included the likes of cardboard, paper, cardboard laminated with aluminium foil, bubble wrap and aluminium foil, fibreglass laminated with aluminium foil.

30

Example 2 – As in Example 1 a test with the plastic sheet was repeated. In this instance the plastic sheet (1 or 2 ply) was suspended between the lid

and the formulation surface. With 1 ply the skinning reduced to 20% and with 2 ply to slightly less than 20%.

Example 3 – As in Example 1 a nylon gauze of 200 micron aperture size,
5 230 micron gauze thickness and 100g per square meter was fixed against
the lid of a container. The nylon gauze layer was attached to the inner
surface of the lid using hot melt adhesive. There was a gap of approximately
0.5 to 1mm between the gauze and the lid. This gap and gauze was
observed to retain significant amounts of paint approximately 1-3mm. The
10 skinning results were reduced to approximately 3%.

Example 4 – As in Example 3, spun glass fibre felt of 500 microns thick and
160g per square meter was attached with hot melt adhesive to the lid. The
skinning results were reduced to approximately 3%.

15

Example 5 – A polystyrene float of 2.5 cm thick and 360g per square meter
was cut out to substantially cover the surface of the formulation. The float
was substantially immersed in the formulation and allowed to float on the top
surface of the formulation. The skinning results were reduced to
20 approximately 3%.

Example 6 – An integrally moulded plastics lid having an integrally moulded
textured or profiled inner plastics surface, in which the texture is
approximately 0.5 – 1.0 mm in thickness and substantially covering the entire
25 area of the inner surface was investigated. The skinning results using the
method of Example 1 were reduced to approximately 18-27%. The degree
of skinning has been found to vary depending on the pattern of texturing
moulded onto the surface. The textured patterns trialed include a spiral
groove producing a textured pattern shown in Figure 3 and a double spiral
30 groove producing a textured pattern as illustrated in Figure 4.

Example 7- Sandblasted, scratched or sanded internal plastics surfaces were also trialed under conditions as in Example 1. A reduction in skinning of between 25-40% compared to an unmodified smooth internal plastics surface was achieved.

5

Example 8 – An integrally moulded polypropylene cloth or gauze on the internal surface of a plastics lid gave complete prevention of skinning under the method described in Example 1.

10 The polypropylene cloth used in this example has a nominal thickness of 1.5mm. It has been established that when this polypropylene cloth is compressed that the thickness is less than about 0.2mm. The effective thickness of the polypropylene cloth on the lid is estimated to be about 0.2mm, when the lid and cloth are injection moulded together. It has been
15 established that the thickness of the polypropylene cloth may be varied considerably. However, during the trials there was always sufficient texture or cloth remaining exposed even in the most significantly polypropylene bonded injection moulded lid conferring near complete resistance to formulation skinning under the conditions described in example 1.

20

The polypropylene cloth employed had a weight of 410 grams per square metre and is composed of fibres having a typical diameter of 40 microns. The weave of the polypropylene would be considered to someone skilled in the art as being a fairly coarse weave and having a rather random pattern of
25 weave.

Several varieties and types of cloth have been tested and all have the desired effect of entraining a layer of paint against the fibres/texture of the cloth and thereby reducing skinning.

30

Example 9 – A layer of polypropylene artificial grass matting (Astroturf™) adhered to an internal surface of a plastics lid has also been found to give complete prevention of skinning when used in the method of Example 1.

- 5 Example 10 – A trial was also conducted using a plastics 10L container wherein the internal side walls of the container were textured with a polypropylene cloth adhered to the side walls of the container.

Two ten litres pails full of paint (an acrylic primer undercoat of high solids) were employed for this example. Both pails used polypropylene cloth fused to the lid during injection moulding as described in example 8 above.

The internal side walls of one pail body were unmodified, while the other pail body had a 4cm wide strip of polypropylene cloth hot melt glued to the internal side wall of the pail, about 3cm of which remained above the paint level held in the pail. Essentially, the internal space of the pail body corresponding to the ullage was modified by the adhering of the polypropylene strip to the wall. The paint for both pails was conditioned to 25°C. The pails were filled with the paint, the lids attached and the pails inverted and shaken for 30 seconds to thoroughly wet all internal surfaces. The pails were then placed in an incubator at 40°C for two days.

The first pail with the polypropylene cloth modified lid and the unmodified pail body produced traces of less than 0.1 gram of paint on the lid and approximately 5.9 grams of skin from the internal side walls of the pail, principally in the ullage space.

The other test pail where the internal side walls of the pail were modified by including the polypropylene strip resulted in no trace of skinning. Furthermore, there was no skin on the exposed flanges. The internal flanges of the pail were not covered with polypropylene cloth. This result was

somewhat surprising, given that the flanges are approximately a 5mm flat face and traditionally prone to skinning.

This result supports that there appears to be a measure of projected
5 humidification from the cloth areas preventing the skinning of paint at these positions.

These results can be compared to those where the same trial was conducted using an unmodified pail and an unmodified lid. Under equivalent conditions
10 described above, approximately 15-25gms of skin formed on the lid and the pail. On the lid 10-15gms of skin would form, while on the internal side walls of the pail approximately 5-10gms of skin formed.

The examples illustrate that the combinations of control measures provide
15 substantial improvements in skinning control.

All the measures tested resulted in significantly less skin formulation arising from the formulation compared to the untreated container.

20 It is an advantage of the present invention that the degree of skinning on formulations of water based or solvent based products may be substantially controlled.

It has also been recognised during experimental trials that when using a
25 textured anti-skinning layer that when conditions are severe or such that skinning does actually occur the layer of skinned paint is retained on the textured layer. The skinned paint does not fall into the body of the formulation as has been traditionally observed when using conventional formulation containers.

30

Where in the foregoing description reference has been made to integers or components having known equivalents, then such equivalents are herein incorporated as if individually set forth.

- 5 Although the invention has been described by way of example and with reference to possible embodiments it is to be appreciated that improvement and/or modifications may be made to these embodiments without departing from the scope of the invention.

What We Claim Is:

1. A container adapted to contain a water based or solvent based formulation, the container including
 - 5 - an anti-skinning layer located on at least a portion of the internal surface of the container, wherein the anti-skinning layer is capable of retaining a layer of the formulation without excluding the formulation vapour in the container from contacting the formulation.
- 10 2 A container according to claim 1, wherein the anti-skinning layer substantially maintains the water or solvent concentration of any of the water or solvent based formulation retained on the anti-skinning layer.
- 15 3 A container according to claim 1 or claim 2 in which the anti-skinning layer is textured.
- 4 A container according to any one of claims 1 to 3, wherein the anti-skinning layer is porous, fibrous, filamentous, a gauze or foam lining.
- 20 5 A container according to any one of claims 1 to 4 in which the anti-skinning layer additionally has insulative properties.
- 6 A container according to any one of claims 1 to 5 in which the anti-skinning layer is integrally moulded or adhered onto the internal surface
- 25 of the container.
- 7 A container according to any one of claims 1 to 6 in which the anti-skinning layer is thermally bonded onto the internal surface of the
- 30 container.

- 8 A container according to any one of claims 1 to 7 in which the
container is adapted to contain approximately 10 ml to 50,000 litres of
formulation.
- 5 9 A container according to any one of claims 1 to 8 in which the water
based or solvent based formulation is a formulation prone to skinning.
- 10 10 A container according to claim 9 in which the formulation prone to
skinning is a latex based paint, an alkyd paint, a flat, a satin, a semi-
10 gloss or a gloss paint, a varnish, a lacquer, a glue or resin such as
PVA™, a resin emulsion or a water based ink.
- 11 11 A container adapted to contain a water based or solvent based
formulation, including
- 15 - a container sealing means including an anti-skinning layer located
on at least a portion of the internal surface of the sealing means,
wherein the anti-skinning layer is capable of retaining a layer of
the formulation, without excluding the formulation vapour in the
container from contacting the formulation.
- 20 12 A container according to claim 11 wherein the anti-skinning layer
substantially maintains the water or solvent concentration of any of the
water or solvent based formulation retained on the anti-skinning layer.
- 25 13 A container according to claim 11 or claim 12, in which the anti-
skinning layer substantially covers the internal surface of the sealing
means.
- 14 14 A container according to any one of claims 11 to 13 in which the anti-
30 skinning layer is textured.

- 15 A container according to any one of claim 11 to 14, in which the anti-
skinning layer is porous, fibrous, filamentous, a gauze or foam lining.
- 16 A container containing according to any one of claims 11 to 15 in
5 which the anti-skinning layer has insulative properties.
- 17 A container according to any one of claims 11 to 16 in which the anti-
skinning layer is integrally moulded or adhered onto the container
sealing means.
- 10 18 A container according to any one of claims 11 to 17 in which the anti-
skinning layer is thermally bonded onto the internal surface of the
container.
- 15 19 A container according to any one of claims 11 to 18 in which the
container is adapted to contain approximately 10 ml to 50,000 litres of
formulation.
- 20 20 A container according to any one of claims 11 to 19 in which the
20 sealing means is a resealable lid.
- 21 21 A container according to any one of claims 11 to 20 in which the water
based or solvent based formulation is prone to skinning.
- 25 22 A container according to claim 21 in which the formulation prone to
skinning is a latex based paint, an alkyd paint, a flat, a satin, a semi-
gloss or a gloss paint, a varnish, a lacquer, a glue or resin such as
PVA™, a resin emulsion or a water based ink.
- 30 23 A container according to any one of claims 11 to 22, in which the
container includes a second anti-skinning layer extending about at least
a portion of the internal surface of the container and the formulation.

- 24 A container according to claim 23, in which the second anti-skinning layer is located between the circumferential lip of the container and the formulation.
- 5
- 25 A container according to claim 23 or claim 24 in which the second anti-skinning layer is textured.
- 26 A container according to any one of claims 23 to 25, in which the second anti-skinning layer is integrally moulded or adhered onto the internal surface of the container.
- 10
- 27 A container according to any one of claims 23 to 26 in which the second anti-skinning layer is thermally bonded onto the internal surface of the container.
- 15
- 28 A container according to any one of claims 23 to 26 in which the second anti-skinning layer is an integrally moulded series of spaced apart concentric ribs integrally moulded into a plastics container between the top of the container proximate the sealing means to at least the formulation level.
- 20
- 29 A container according to claim 28 in which the integrally moulded series of ribs extend from the top of the internal surface of the container proximate to the sealing means substantially to the container base.
- 25
- 30 A method of preventing skin formation on a water based or solvent based formulation, the method including the steps of:
- 30
- placing the water based or solvent based formulation in a container according to any one of claims 1 to 29, and
 - storing or transporting the formulation.

- 31 A sealing means adapted to substantially control skinning of water
based or solvent based formulations, in which the sealing means
includes an anti-skinning layer, in which the layer is located on at least
5 a portion of the inner surface of the sealing means, wherein the anti-
skinning layer, when in use on a container adapted to contain a water-
based or solvent based formulation, is capable of retaining a layer of
the formulation, without excluding the formulation vapour in the
container from contacting the formulation.
- 10 32 A sealing means according to claim 31 wherein the anti-skinning layer
substantially maintains the water or solvent concentration of any of the
water or solvent based formulation retained on the anti-skinning layer.
- 15 33 A sealing means according to claim 31 or claim 32 in which the anti-
skinning layer is textured.
- 34 A sealing means according to any one of claims 31 to 33 in which the
anti-skinning layer is porous, fibrous, filamentous, a gauze or foam
20 lining.
- 35 A sealing means according to any one of claims 31 to 34 in which the
anti-skinning layer has insulative properties.
- 25 36 A sealing means according to any one of claims 31 to 35 in which the
anti-skinning layer is approximately 0.001 mm to 5 cm thick.
- 37 A sealing means according to any one of claims 31 to 36 in which the
anti-skinning layer is integrally moulded or adhered onto the internal
30 surface of the sealing means.

- 38 A sealing means according to any one of claims 31 to 37 in which the anti-skinning layer is thermally bonded onto the internal surface of the sealing means.
- 5 39 A sealing means according to any one of claims 31 to 38 in which the anti-skinning layer covers substantially the entire surface area of the internal surface of the sealing means.
- 40 A sealing means according to any one of claims 31 to 39, in which the
10 sealing means is a resealable lid.
- 41 A container including a sealing means, in which the container is adapted to contain a formulation prone to skinning by loss of water or solvent wherein at least a portion of the internal surface of the
15 container in proximity with the ullage space of the container has a means capable of retaining a layer of the formulation, without excluding the formulation vapour in the container from contacting the formulation.
- 20 42 A container according to claim 41 wherein said means substantially maintains the water or solvent concentration of the layer of formulation retained.
- 43 A container according to claim 41 or claim 42 in which the means is an
25 anti-skinning layer from 0.001 to 5 mm thick.
- 44 A container according to any one of claims 41 to 43 in which the anti-skinning layer substantially covers the internal surface of the sealing means.
30
- 45 A container according to claim 41 or claim 44 in which the anti-skinning layer is textured.

- 46 A container according to any one of claims 41 to 45 in which the anti-skinning layer is porous, fibrous, filamentous, a gauze or foam lining.
- 5 47 A container according to any one of claims 41 to 46 in which the anti-skinning layer has insulative properties.
- 48 A container according to any one of claims 41 to 47 in which the anti-skinning layer is integrally moulded or adhered to the internal surface of
10 the sealing means.
- 49 A container according to any one of claims 41 to 48, in which the anti-skinning layer is selected from a group consisting of woven or unwoven polyolefin cloth or gauze, artificial grass matting and glass fibre felt.
15
- 50 A container according to claim 49 wherein the layer is thermally bonded to a plastics sealing means.
- 51 A container according to claim 50 wherein the plastics sealing means is
20 a resealable lid.



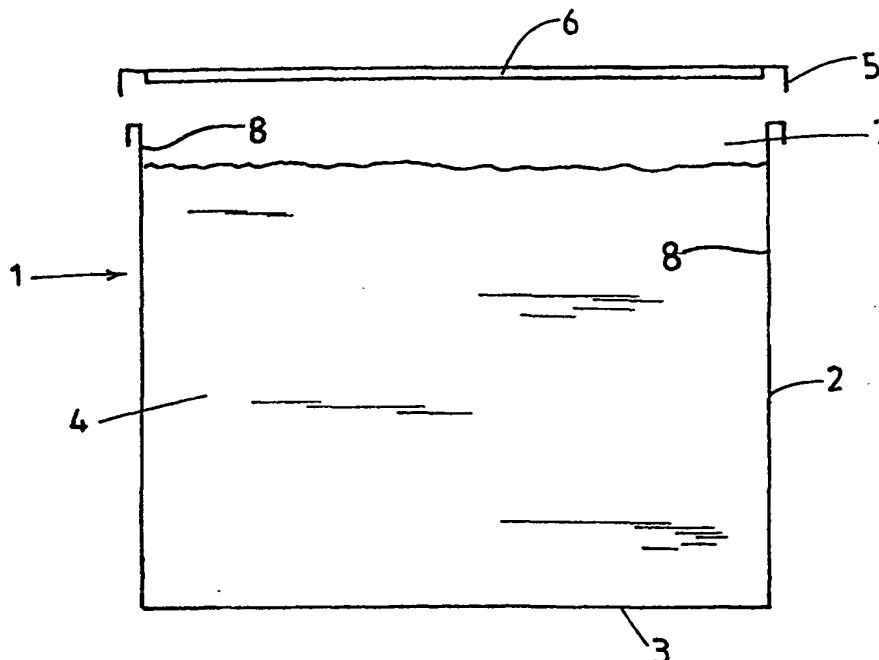
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(54) Title: METHOD OF PACKAGING SOLVENT OR WATER BASED FORMULATIONS TO REDUCE SKINNING

(57) Abstract

The present invention relates to packaging water or solvent based formulations, in particular to those formulations which are prone to skinning. The invention comprises a container (1) that is adapted to contain such a formulation (4) in which an anti-skinning layer (6) is located between at least a portion of an internal surface of the container (1) or a lid (5) and the formulation (4).



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METHOD OF PACKAGING SOLVENT OR WATER BASED FORMULATIONS TO REDUCE SKINNING

Field of the Invention

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The present invention relates generally to a method of packaging water or solvent based formulations, such as paints, resins and glues. In particular the present invention relates to a method of packaging such formulations which minimises skinning of the formulation on the internal surfaces of containers in which the formulation is stored.

10

Background

15

It is known to store water-based or solvent based formulations in containers. Such containers have a lid or sealing means to isolate the formulation from the surrounding atmosphere.

20

Commercially available paints are generally stored in a number of different sized containers. The container size may range from ten millilitres through to 50,000 litres.

25

Paint containers which contain approximately 1 litre through to 50,000 litres of a paint formulation are vulnerable to the forming of a skin on the internal surfaces of the container upon storage. The skin is a film of paint which is in contact with the lid and typically the upper internal side of the paint container. The skinning of paints in paint containers is a recognised problem in the industry and occurs in containers made out of plastics or metals. If the skinning is quite considerable it may be necessary in some instances to sieve the paint formulation to remove the skin prior to using the paint.

30

5 Skinning on the surface of solvent based (alkyd) paint has been known for many decades. The mechanism is known to involve the uptake of oxygen leading to the oxidative cross-linking (skinning) of the paint. There are various additives that are known which can be used in alkyd paints to inhibit premature crosslinking.

10 Typically, volatile oximes are used to chelate to the polymerisation catalysts (typically transition metals, such as cobalt, salts of organic acids such as octanoic acid or naphthenic acid) and inhibit the activity in the wet state. Methyl ethyl ketoxime is commonly used as an anti skin additive in alkyd paints.

15 Otherwise, means or methods of preventing or reducing skinning of paints in containers are unknown.

20 The skinning of paint is particularly pronounced when paint containers are stored under varying external temperature conditions. The occurrence of skinning has been found to be more prevalent during the warmer conditions of summer.

25 It is an object of the present invention to alleviate some of the skinning difficulties experienced in the paint industry, or to at least provide the public with a useful choice.

25 Summary of the Invention

30 The present invention provides a container, which is adapted to contain a water based or solvent based formulation, the container including

- an anti-skinning layer located between at least a portion of the internal surface of the container and the formulation.

Preferably, the anti-skinning layer substantially maintains the water or solvent concentration of a portion of the formulation retained on the anti-skinning layer.

- 5 Preferably, the anti-skinning layer is textured, porous, fibrous, filamentous, a gauze, or foam lining.

Preferably, the anti-skinning layer additionally has insulative properties.

- 10 Preferably, the anti-skinning layer is integrally moulded into the internal surface of the container.

Preferably, the container contains approximately 10 ml to 50,000 litres of formulation.

- 15 Preferably, the water based or solvent based formulation is a formulation prone to skinning, such as a latex based paint, an alkyd paint, a flat, a satin, a semi-gloss or a gloss paint, a varnish, a lacquer, a glue or resin such a PVA™, a resin emulsion or a water based ink.

- 20 In another aspect the present invention provides a container, which is adapted to contain a water based or solvent based formulation, the container including

- 25 - a container sealing means comprising an anti-skinning layer located between the internal surface of the sealing means and the formulation.

- 30 Preferably, the anti-skinning layer substantially maintains the water or solvent concentration of a portion of the formulation retained on the anti-skinning layer.

Preferably, the anti-skinning layer is textured, porous, fibrous, filamentous a gauze, or foam lining.

Preferably, the anti-skinning layer additionally has insulative properties.

5

Preferably, the anti-skinning layer is located on the internal surface of the sealing means and integrally moulded with the container sealing means.

10

Preferably, the container contains approximately 10 ml to 50,000 litres of formulation, and the sealing means is a resealable lid.

15

In another aspect of the present invention there is provided a container adapted to contain a water based or solvent based formulation and a container sealing means as described above, the container being further adapted to include a second anti-skinning layer on the internal surface of the container.

Preferably, the second anti-skinning layer is textured.

20

Preferably, the second anti-skinning layer is integrally moulded into the container.

25

Preferably, the second anti-skinning layer is located between the circumferential lip of the container and the formulation.

30

Preferably, the second anti-skinning layer is an integrally moulded series of spaced apart concentric ribs moulded into a plastics container between the top of the container proximate the sealing means to at least the formulation level.

Preferably, the texturing extends at least 1 -10 microns (0.001 - 0.01mm) from the internal surface of the container.

In a further aspect of the present invention there is provided a method of preventing skin formation on a water based or solvent based formulation, the method including the steps of

5

- placing the water based or solvent based formulation in a container as described above, and
- storing or transporting the formulation.

10

Preferably, the anti-skinning layer is textured, having insulative properties and is located proximate the internal surface of the sealing means.

15

Preferably, the container contains between 10 ml to 50,000 litres of formulation, and the sealing means is a resealable lid.

20

In a further aspect of the present invention there is provided a sealing means, the sealing means being adapted to substantially control skinning of water based or solvent based formulations, in which the sealing means comprises an anti-skinning layer secured proximate to the inner surface of the sealing means.

25

Preferably, the anti-skinning layer is approximately 0.001 millimetres to 5 centimetres thick, is textured and is located on the internal surface of the sealing means.

30

Preferably, the anti-skinning layer covers substantially the entire surface area of the internal surface of the sealing means, and the sealing means is a resealable lid.

In a further aspect the present invention provides a container including a sealing means, in which the container is adapted to contain a formulation

prone to skinning wherein at least a portion of the internal surface of the container in proximity with the ullage space of the container has a means of retaining a layer of the formulation.

5 Preferably, the means is a textured anti-skinning layer from 0.001 to 5 mm thick, which substantially covers the internal surface of the sealing means.

Preferably, the anti-skinning layer is porous, has insulative properties and is integrally moulded onto the internal surface of the sealing means.

10

Preferably, the anti-skinning layer is selected from a group consisting of woven or unwoven polyolefin cloth or gauze, artificial grass matting and glass fibre felt and is thermally bonded to a plastics sealing means.

15 The term "insulative properties", as used in this specification with reference to the anti-skinning layer, is used to refer to a layer that has the properties of reducing temperature and concentration differentials within the container interior, and modulating heat transfer between the environment and the container interior.

20

Further aspects of the present invention will become apparent from the following description given by way of example and with reference to any one of the following figures, in which:

25 Figure 1 illustrates a container adapted to contain a water or solvent based formulation and a lid means comprising a lid liner.

Figure 2 illustrates the internal surface of a lid means including a lid liner.

30 Figure 3 illustrates a textured pattern on the internal surface of a lid.

Figure 4 illustrates an alternative textured pattern on the internal surface of a lid.

Detailed Description of the Invention

5

A solvent or water based formulation container 1 is illustrated in Figure 1. The container preferably, comprises substantially upright walls 2 and a base means 3. A water based or solvent based formulation 4 is contained within the container. Preferably, the formulation substantially fills the container. The container may be adapted to contain approximately 10 ml to 50,000 litres of formulation 4.

10

A sealing means or lid 5 is adapted to cover the formulation 4 in the container 1 and to substantially exclude ingress of the external atmosphere into the internal compounds of the container and loss of the internal atmosphere out of the container. Preferably, the container lid is adapted to be substantially airtight when located securely on the container.

15

An internal surface layer or lining 6 located on the lid is illustrated in Figure 1. The layer or lining 6, preferably substantially covers the entire internal surface of the lid means. In some instances there may be an ullage or space 7, between the formulation 4 and the lid liner 6. The internal surface of the container 8 can be either in contact with the formulation or in contact with the vapour of the formulation as shown in Figure 1.

20

25

In Figure 2 the inner surface of the lid 5 is illustrated with a covering liner 6.

30

During storage of containers of formulations of solvent or water based mixtures, the container 2, the formulation 4, the ullage 7 and the lid means 5 all form part of a system which is vulnerable to temperature changes. When the surrounding environment of the container is constant, the

temperatures of the container, the formulation and the ullage space is substantially equal to the temperature of the external environment. The vapour arising from the formulation is maintained in the ullage space between the internal surface of the lid and the body of the formulation. It has been established that no skinning occurs under conditions whereby the temperature of the container, the body of the formulation and ullage space are at equilibrium. To maintain such a temperature equilibrium from the time of filling the container to storage and ultimately to the time just prior to the use of the formulation would require very expensive atmospheric control means.

However, when the temperature of the external environment increases, for example, where the container is sitting in sunlight, the external surface of the container and lid can increase while the corresponding temperature of the formulation within the container, the vapour in the ullage 7, and the lid surface can be substantially different. The temperature of the lid 5 and the adjacent formulation vapour in the ullage 7 increases in temperature more quickly than the body of the formulation 4. A temperature gradient may be created between the lid and the body of the formulation.

It has been established that under conditions of storage of containers 1 where the temperature of the external atmosphere is not maintained at a steady state, the formulation has a tendency to skin proximate to the lid of the container. This is thought to arise because of the temperature gradient and thereby concentration gradient of vapour existing between the lid and the formulation.

In a closed and substantially watertight container there is only limited scope for the drying of paint. Under equilibrium conditions the air in the ullage space 7 is saturated with a concentration of water or solvent vapour, which depends on the composition of the paint or formulation. Generally, for a water based formulation the concentration of water vapour

is above 90%. Skinning of paint does not normally occur under these conditions. It has been established that pails of paint stored at $25 \pm 2^\circ\text{C}$ for 3 months have not skinned. However, pails of the same paint skinned, when subjected to a single heating cycle exceeding about 5°C . It has been
5 found that the greater the heating step, the greater the degree of skinning.

The temperature gradients create concentration gradients of water or solvent vapour. The air proximate to the layer of formulation on the lid becomes dry when the lid is heated and water is lost from the layer of
10 paint.

In typical storage conditions it is difficult and expensive to maintain temperature to within one or two degrees Centigrade. However the issue is the rate of change of temperature, where sudden changes are worse
15 than gradual changes. Lids are prone to skinning because they have only weak thermal coupling to the body of paint, the main heat reservoir. Lids are forced to follow ambient temperatures, while the paint in the body of the container responds more sluggishly to temperature changes. Metal containers have better thermal conduction properties than do typical plastic
20 containers. Temperature differentials are generally less for metal containers than they are for plastic containers. Metal containers are known to be less prone to skinning.

While the mechanism of skinning is as discussed there are two additional
25 aspects. One is that by retaining a thicker layer of paint on the inner surface of container there is better thermal coupling to the body of paint. This acts to reduce the temperature differential that occurs between the lid and the body of paint or formulation. Some paints are inherently thicker than others and will naturally form thicker films which are less prone to
30 skinning under these conditions. Another aspect of the mechanism is that the evaporation of water or solvent vapour from the paint acts to carry away heat, which also acts to reduce the temperature differential. Both

these additional effects are only effective as long as the layer of paint remains substantially fluid. By retaining a thicker layer of paint, and thereby a greater concentration of water or solvent proximate the inner surfaces of both the container, around the ullage space, and proximate the internal surface of the lid, the time of wetness is prolonged compared to that observed with conventional lid surfaces. This provides a method of extended thermodynamic cooling because of evaporation of the water or solvent from the thicker layer of retained formulation. Additionally, it is thought that the thermal conductivity is greater between the lid and thicker layer of retained formulation and the bulk of the formulation.

In order to minimise the concentration and temperature gradient arising under conditions whereby the external temperature of the container 1 is not maintained at a constant value, it has been found that the incorporation of a textured, porous, fibrous, filamentous, gauze or foam-like layer of approximately 0.001 to 5 mm either suspended between the lid and formulation or located on or integrated with the internal surface of the lid can control skinning. The results of a particular experiment illustrating the effects of the skinning control measures achieved from various linings are illustrated in the following examples.

Example 1 – Pails of water based high solids acrylic undercoat were placed in an incubator at 40°C for one day. The initial temperature of the containers was conditioned to 24°C. The container contained 10 litres of formulation. A container, comprising a non-lined lid was used as a reference. The amount of skin formed in the reference container was 11.2 grams. The degree of skinning was determined by removing the skin off the lid with a soft brush under water into a 500 μ m test sieve. The skin which was collected was spun dry, weighed and bottled for future reference.

The lid liners that were compared are illustrated in the following table.

	<u>Lid Lining Means</u>	<u>Skin Percentage</u>
	Untreated container (reference)	100%
5	Plastic sheet lid liner ¹	38%
	Container insulation ²	22%
	Internal polystyrene float	17%
	Fibreglass gauze on lid	3%

10 ¹ The single ply plastic sheet tested was 75 micron polyethylene, 75g per square metre per ply.

15 ² Insulation means included the likes of cardboard, paper, cardboard laminated with aluminium foil, bubble wrap and aluminium foil, fibreglass laminated with aluminium foil.

20 Example 2 – As in Example 1 a test with the plastic sheet was repeated. In this instance the plastic sheet (1 or 2 ply) was suspended between the lid and the formulation surface. With 1 ply the skinning reduced to 20% and with 2 ply to slightly less than 20%.

25 Example 3 – As in Example 1 a nylon gauze of 200 micron aperture size, 230 micron gauze thickness and 100g per square meter was fixed against the lid of a container. The nylon gauze layer was attached to the inner surface of the lid using hot melt adhesive. There was a gap of approximately 0.5 to 1mm between the gauze and the lid. This gap and gauze was observed to retain significant amounts of paint approximately 1-3mm. The skinning results were reduced to approximately 3%.

30 Example 4 – As in Example 3, spun glass fibre felt of 500 microns thick and 160g per square meter was attached with hot melt adhesive to the lid. The skinning results were reduced to approximately 3%.

Example 5 – A polystyrene float of 2.5 cm thick and 360g per square meter was cut out to substantially cover the surface of the formulation. The float was substantially immersed in the formulation and allowed to float on the top surface of the formulation. The skinning results were reduced to approximately 3%.

Example 6 – An integrally moulded plastics lid having an integrally moulded textured or profiled inner plastics surface, in which the texture is approximately 0.5 – 1.0 mm in thickness and substantially covering the entire area of the inner surface was investigated. The skinning results using the method of Example 1 were reduced to approximately 18-27%. The degree of skinning has been found to vary depending on the pattern of texturing moulded onto the surface. The textured patterns trialed include a spiral groove producing a textured pattern shown in Figure 3 and a double spiral groove producing a textured pattern as illustrated in Figure 4.

Example 7 – Sandblasted, scratched or sanded internal plastics surfaces were also trialed under conditions as in Example 1. A reduction in skinning of between 25-40% compared to an unmodified smooth internal plastics surface was achieved.

Example 8 – An integrally moulded polypropylene cloth or gauze on the internal surface of a plastics lid gave complete prevention of skinning under the method described in Example 1.

The polypropylene cloth used in this example has a nominal thickness of 1.5mm. It has been established that when this polypropylene cloth is compressed that the thickness is less than about 0.2mm. The effective thickness of the polypropylene cloth on the lid is estimated to be about 0.2mm, when the lid and cloth are injection moulded together. It has been established that the thickness of the polypropylene cloth may be varied

considerably. However, during the trials there was always sufficient texture or cloth remaining exposed even in the most significantly polypropylene bonded injection moulded lid conferring near complete resistance to formulation skinning under the conditions described in example 1.

The polypropylene cloth employed had a weight of 410 grams per square metre and is composed of fibres having a typical diameter of 40 microns. The weave of the polypropylene would be considered to someone skilled in the art as being a fairly coarse weave and having a rather random pattern of weave.

Several varieties and types of cloth have been tested and all have the desired effect of entraining a layer of paint against the fibres/texture of the cloth and thereby reducing skinning.

Example 9 – A layer of polypropylene artificial grass matting (Astroturf™) adhered to an internal surface of a plastics lid has also been found to give complete prevention of skinning when used in the method of Example 1.

Example 10 – A trial was also conducted using a plastics 10L container wherein the internal side walls of the container were textured with a polypropylene cloth adhered to the side walls of the container.

Two ten litres pails full of paint (an acrylic primer undercoat of high solids) were employed for this example. Both pails used polypropylene cloth fused to the lid during injection moulding as described in example 8 above.

The internal side walls of one pail body were unmodified, while the other pail body had a 4cm wide strip of polypropylene cloth hot melt glued to the internal side wall of the pail, about 3cm of which remained above the paint level held in the pail. Essentially, the internal space of the pail body

corresponding to the ullage was modified by the adhering of the polypropylene strip to the wall. The paint for both pails was conditioned to 25°C. The pails were filled with the paint, the lids attached and the pails inverted and shaken for 30 seconds to thoroughly wet all internal surfaces.

5 The pails were then placed in an incubator at 40°C for two days.

The first pail with the polypropylene cloth modified lid and the unmodified pail body produced traces of less than 0.1 gram of paint on the lid and approximately 5.9 grams of skin from the internal side walls of the pail,

10 principally in the ullage space.

The other test pail where the internal side walls of the pail were modified by including the polypropylene strip resulted in no trace of skinning. Furthermore, there was no skin on the exposed flanges. The internal

15 flanges of the pail were not covered with polypropylene cloth. This result was somewhat surprising, given that the flanges are approximately a 5mm flat face and traditionally prone to skinning.

This result supports that there appears to be a measure of projected humidification from the cloth areas preventing the skinning of paint at

20 these positions.

These results can be compared to those where the same trial was conducted using an unmodified pail and an unmodified lid. Under

25 equivalent conditions described above, approximately 15-25gms of skin formed on the lid and the pail. On the lid 10-15gms of skin would form, while on the internal side walls of the pail approximately 5-10gms of skin formed.

30 The examples illustrate that the combinations of control measures provide substantial improvements in skinning control.

All the measures tested resulted in significantly less skin formulation arising from the formulation compared to the untreated container.

5 It is an advantage of the present invention that the degree of skinning on formulations of water based or solvent based products may be substantially controlled.

10 It has also been recognised during experimental trials that when using a textured anti-skinning layer that when conditions are severe or such that skinning does actually occur the layer of skinned paint is retained on the textured layer. The skinned paint does not fall into the body of the formulation as has been traditionally observed when using conventional formulation containers.

15 Where in the foregoing description reference has been made to integers or components having known equivalents, then such equivalents are herein incorporated as if individually set forth.

20 Although the invention has been described by way of example and with reference to possible embodiments it is to be appreciated that improvement and/or modifications may be made to these embodiments without departing from the scope of the invention.

What We Claim Is:

1. A container adapted to contain a water based or solvent based formulation, the container including
5 - an anti-skinning layer located between at least a portion of the internal surface of the container and the formulation.
2. A container according to claim 1, in which the anti-skinning layer substantially maintains the water or solvent concentration of a
10 portion of the formulation retained on the anti-skinning layer.
3. A container according to claim 1 or claim 2 in which the anti-skinning layer is textured.
- 15 4. A container according to any one of claims 1 to 3 in which the anti-skinning layer additionally has insulative properties.
5. A container according to any one of claims 1 to 4 in which the anti-skinning layer is integrally moulded into the internal surface of the
20 container.
6. A container according to any one of claims 1 to 5 in which the container contains approximately 10 ml to 50,000 litres of formulation.
25
7. A container according to any one of claims 1 to 6 in which the water based or solvent based formulation is a formulation prone to skinning.
8. A container according to claim 7 in which the formulation prone to
30 skinning is a latex based paint, an alkyd paint, a flat, a satin, a semi-gloss or a gloss paint, a varnish, a lacquer, a glue or resin such a PVA™, a resin emulsion or a water based ink.

9. A container adapted to contain a water based or solvent based formulation, including
- 5 - a container sealing means comprising an anti-skinning layer located between the internal surface of the sealing means and the formulation.
- 10 10. A container according to claim 9 in which the anti-skinning layer maintains the water or solvent concentrations of any formulation retained on the anti-skinning layer.
11. A container according to claim 9 or claim 10 in which the anti-skinning layer is textured.
- 15 12. A container according to any one of claims 9 to 11, in which the anti-skinning layer is porous.
13. A container containing according to any one of claims 9 to 12 in which the anti-skinning layer is insulative.
- 20 14. A container according to any one of claims 9 to 13, in which the anti-skinning layer is located on the internal surface of the sealing means.
15. A container according to any one of claims 9 to 14 in which the anti-skinning layer is integrally moulded into container sealing means.
- 25 16. A container according to any one of claims 7 to 15 in which the container is adapted to contain approximately 10 ml to 50,000 litres of formulation.
- 30 17. A container according to any one of claims 9 to 16 in which the sealing means is a resealable lid.

18. A container according to any one of claims 9 to 17 in which the water based or solvent based formulation is a paint.
- 5 19. A container according to claim 18 in which the paint is a latex based paint, an alkyd paint, a flat, a satin, a semi-gloss or a gloss paint, a varnish, a lacquer, a glue or resin such a PVA™, a resin emulsion or a water based ink.
- 10 20. A container according to any one of claims 9 to 19, in which the container is further adapted to include a second anti-skinning layer extending about at least a portion of the internal surface of the container and the formulation.
- 15 21. A container according to claim 20, in which the second anti-skinning layer is located between the circumferential lip of the container and the formulation.
- 20 22. A container according to claim 20 or claim 21 in which the second anti-skinning layer is textured.
- 25 23. A container according to any one of claims 20 to 22, in which the second anti-skinning layer is integrally moulded onto the internal surface of the container.
- 30 24. A container according to any one of claims 20 to 23 in which the second anti-skinning layer is an integrally moulded series of spaced apart concentric ribs integrally moulded into a plastics container between the top of the container proximate the sealing means to at least the formulation level.

25. A container according to claim 24 in which the integrally moulded series of ribs extend from the top of the internal surface of the container proximate to the sealing means substantially to the container base.
- 5
26. A method of preventing skin formation on a water based or solvent based formulation, the method including the steps of:
- placing the water based or solvent based formulation in a container according to any one of claims 1 to 25, and
 - 10 - storing or transporting the formulation.
27. A sealing means adapted to substantially control skinning of water based or solvent based formulations, in which the sealing means comprises an anti-skinning layer, and in which the layer is secured proximate to the inner surface of the sealing means.
- 15
28. A sealing means according to claim 27, in which the anti-skinning layer substantially maintains the water or solvent concentration of a portion of the formulation retained on the anti-skinning layer.
- 20
29. A sealing means according to claim 27 or claim 28 in which the anti-skinning layer is textured and is located on the internal surface of the sealing means.
- 25
30. A sealing means according to any one of claims 27 to 29 in which the anti-skinning layer is insulative.
31. A sealing means according to any one of claims 27 to 30 in which the anti-skinning layer is approximately 0.001 mm to 5 cm thick.
- 30

32. A sealing means according to any one of claims 27 to 31 in which the anti-skinning layer is integrally moulded onto the internal surface of the sealing means.
- 5 33. A sealing means according to any one of claims 27 to 32 in which the anti-skinning layer covers substantially the entire surface area of the internal surface of the sealing means.
- 10 34. A sealing means according to any one of claims 27 to 33, in which the sealing means is a resealable lid.
- 15 35. A container including a sealing means, in which the container is adapted to contain a formulation prone to skinning wherein at least a portion of the internal surface of the container in proximity with the ullage space of the container has a means of retaining a layer of the formulation.
- 20 36. A container according to claim 35, in which the means is an anti-skinning layer from 0.001 to 5 mm thick.
37. A container according to claim 36 in which the anti-skinning layer substantially covers the internal surface of the sealing means.
- 25 38. A container according to claim 36 or claim 37 in which the anti-skinning layer is textured.
39. A container according to any one of claims 36 to 38 in which the anti-skinning layer is porous.
- 30 40. A container according to any one of claims 36 to 39 in which the anti-skinning layer has insulative properties.

41. A container according to any one of claims 36 to 40 in which the anti-skinning layer is integrally moulded onto the internal surface of the sealing means.
- 5 42. A container according to any one of claims 36 to 41, in which the anti-skinning layer is selected from a group consisting of woven or unwoven polyolefin cloth or gauze, artificial grass matting and glass fibre felt.
- 10 43. A container according to claim 42 wherein the layer is thermally bonded to a plastics sealing means.
44. A container according to claim 43 wherein the plastics sealing means is a resealable lid.

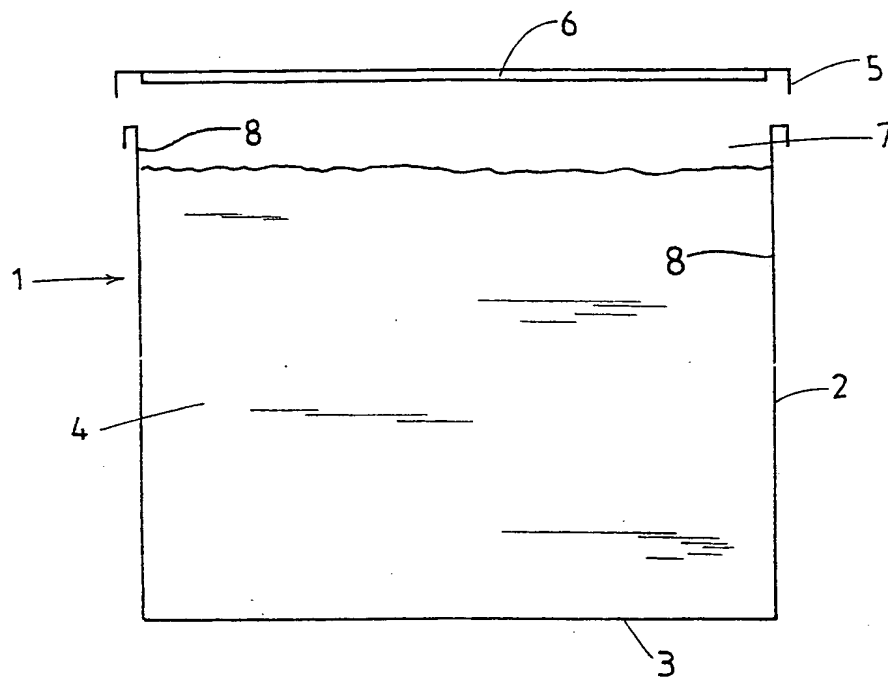


FIG. 1

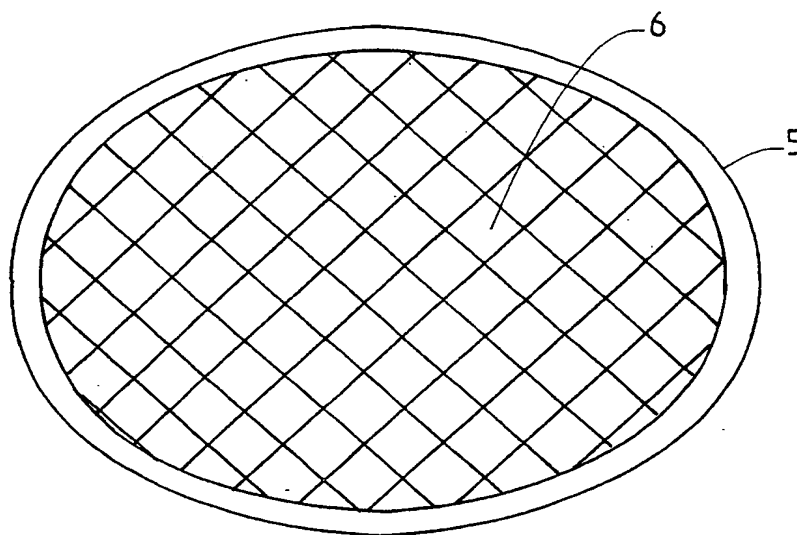


FIG. 2

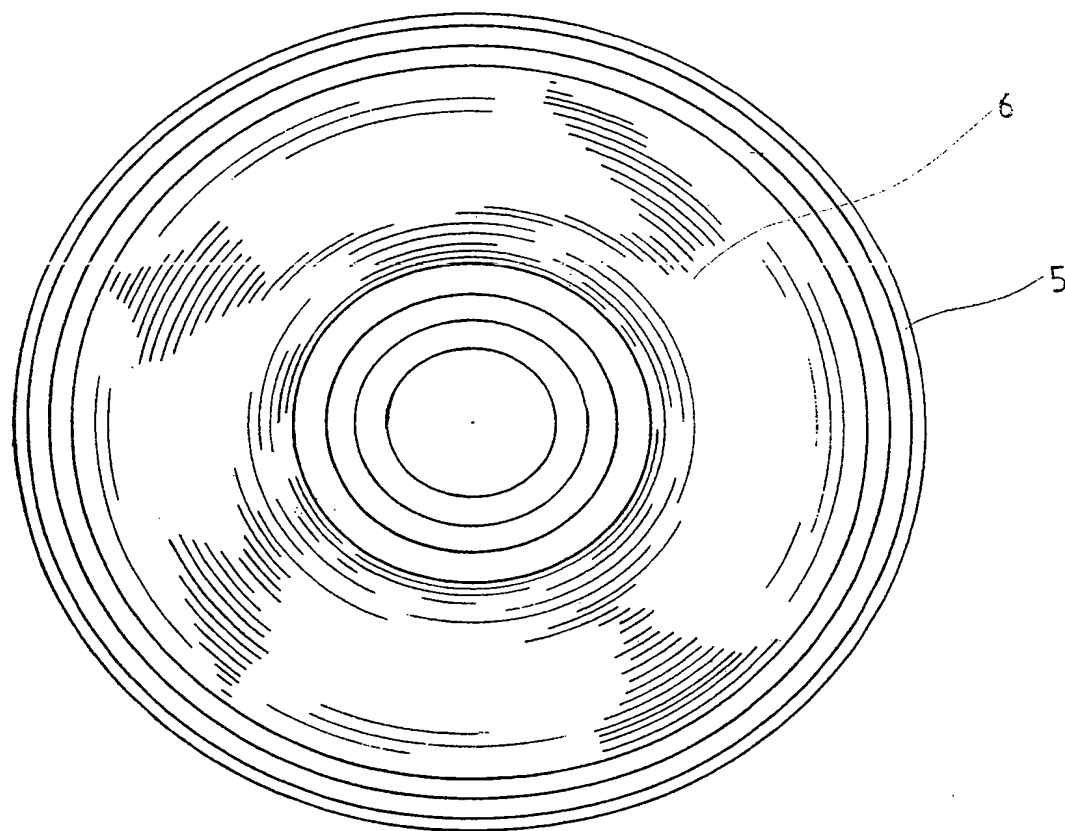


FIG. 3

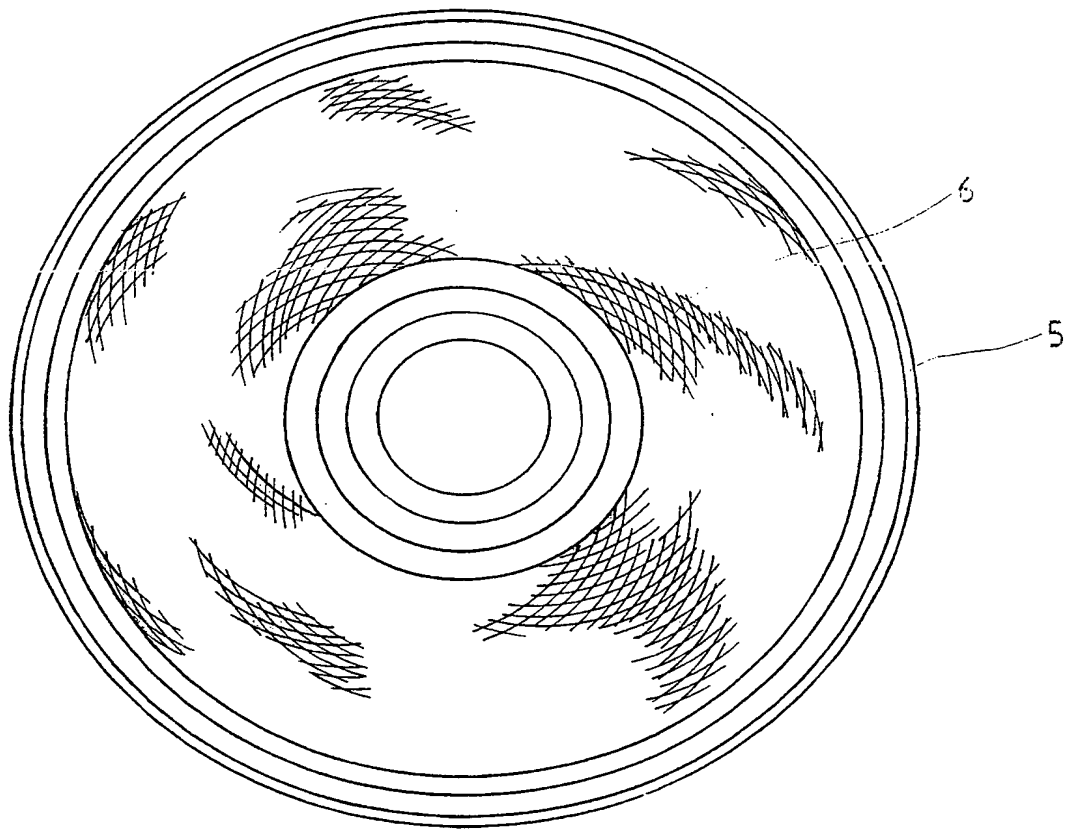


FIG. 4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ99/00188

A. CLASSIFICATION OF SUBJECT MATTER

Int. Cl. 7: B65D 81/24, 43/02, B44D 3/12

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC B44D 3/12, B65D 25/14, 43/00, 43/02, 51/24, 53/-, 81/18, 81/24, 81/38, 85/72, 90/04, 90/06, 90/38

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

AU IPC B44D 3/12, 43/00, 43/02, 81/18, 81/24

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPAT

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4625883 A (BURKE et al) 2 December 1986 Whole document, particularly figure 4	1, 6-9, 14, 16-19, 26, 27, 31, 33, 34
X	US 5249692 A (GUNDERSON) 5 October 1993 Whole document	1, 6-9, 14-19, 26, 27, 31-34
X	US 5305909 A (MERRITT) 26 April 1994 Whole document	1, 6-9, 16-21, 26, 27, 31, 34

☒ Further documents are listed in the continuation of Box C

☒ See patent family annex

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent but published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search
16 March 2000

Date of mailing of the international search report
22 MAR 2000

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/NZ99/00188

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4691838 A (GRAHAM et al) 8 September 1987 Whole document	1, 3, 6-8, 16-19, 26
X	GB 2306429 A (ALLBRIGHTON) 7 May 1997 Whole document	1, 6-8, 16, 18, 19, 26

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.
PCT/NZ99/00188

This Annex lists the known "A" publication level patent family members relating to the patent documents cited in the above-mentioned international search report. The Australian Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

Patent Document Cited in Search Report		Patent Family Member					
US	4625883						
US	5249692						
US	5305909						
US	4691838	AU	36615/84	CA	1247560	EP	151876
		NZ	210570	ZA	8409748		
GB	2306429						
END OF ANNEX							

AMENDED CLAIMS

[received by the International Bureau on 10 May 2000 (10.05.00);
original claims 1-44 replaced by new claims 1-51 (7 pages)]

1. A container adapted to contain a water based or solvent based formulation, the container including
 - 5 - an anti-skinning layer located on at least a portion of the internal surface of the container, wherein the anti-skinning layer is capable of retaining a layer of the formulation.
- 2 A container according to claim 1, wherein the anti-skinning layer
10 substantially maintains the water or solvent concentration of any of the water or solvent based formulation retained on the anti-skinning layer.
- 3 A container according to claim 1 or claim 2 in which the anti-skinning
15 layer is textured.
- 4 A container according to any one of claims 1 to 3, wherein the anti-skinning layer is porous, fibrous, filamentous, a gauze or foam lining.
- 20 5 A container according to any one of claims 1 to 4 in which the anti-skinning layer additionally has insulative properties.
- 6 A container according to any one of claims 1 to 5 in which the anti-skinning layer is integrally moulded or adhered onto the internal
25 surface of the container.
- 7 A container according to any one of claims 1 to 6 in which the anti-skinning layer is thermally bonded onto the internal surface of the
30 container.

- 8 A container according to any one of claims 1 to 7 in which the container is adapted to contain approximately 10 ml to 50,000 litres of formulation.
- 5 9 A container according to any one of claims 1 to 8 in which the water based or solvent based formulation is a formulation prone to skinning.
- 10 10 A container according to claim 9 in which the formulation prone to skinning is a latex based paint, an alkyd paint, a flat, a satin, a semi-gloss or a gloss paint, a varnish, a lacquer, a glue or resin such as PVA™, a resin emulsion or a water based ink.
- 11 A container adapted to contain a water based or solvent based formulation, including
- 15 - a container sealing means including an anti-skinning layer located on at least a portion of the internal surface of the sealing means, wherein the anti-skinning layer is capable of retaining a layer of the formulation.
- 20 12 A container according to claim 11 wherein the anti-skinning layer substantially maintains the water or solvent concentration of any of the water or solvent based formulation retained on the anti-skinning layer.
- 25 13 A container according to claim 11 or claim 12, in which the anti-skinning layer substantially covers the internal surface of the sealing means.
- 30 14 A container according to any one of claims 11 to 13 in which the anti-skinning layer is textured.
- 15 A container according to any one of claim 11 to 14, in which the anti-

skinning layer is porous, fibrous, filamentous, a gauze or foam lining.

- 5
- 16 A container containing according to any one of claims 11 to 15 in which the anti-skinning layer has insulative properties.
- 17 A container according to any one of claims 11 to 16 in which the anti-skinning layer is integrally moulded or adhered onto the container sealing means.
- 10 18 A container according to any one of claims 11 to 17 in which the anti-skinning layer is thermally bonded onto the internal surface of the container.
- 15 19 A container according to any one of claims 11 to 18 in which the container is adapted to contain approximately 10 ml to 50,000 litres of formulation.
- 20 20 A container according to any one of claims 11 to 19 in which the sealing means is a resealable lid.
- 21 A container according to any one of claims 11 to 20 in which the water based or solvent based formulation is prone to skinning.
- 25 22 A container according to claim 21 in which the formulation prone to skinning is a latex based paint, an alkyd paint, a flat, a satin, a semi-gloss or a gloss paint, a varnish, a lacquer, a glue or resin such as PVA™, a resin emulsion or a water based ink.
- 30 23 A container according to any one of claims 11 to 22, in which the container includes a second anti-skinning layer extending about at least a portion of the internal surface of the container and the formulation.

- 24 A container according to claim 23, in which the second anti-skinning layer is located between the circumferential lip of the container and the formulation.
- 5
- 25 A container according to claim 23 or claim 24 in which the second anti-skinning layer is textured.
- 26 A container according to any one of claims 23 to 25, in which the second anti-skinning layer is integrally moulded or adhered onto the internal surface of the container.
- 10
- 27 A container according to any one of claims 23 to 26 in which the second anti-skinning layer is thermally bonded onto the internal surface of the container.
- 15
- 28 A container according to any one of claims 23 to 26 in which the second anti-skinning layer is an integrally moulded series of spaced apart concentric ribs integrally moulded into a plastics container between the top of the container proximate the sealing means to at least the formulation level.
- 20
- 29 A container according to claim 28 in which the integrally moulded series of ribs extend from the top of the internal surface of the container proximate to the sealing means substantially to the container base.
- 25
- 30 A method of preventing skin formation on a water based or solvent based formulation, the method including the steps of:
- 30
- placing the water based or solvent based formulation in a container according to any one of claims 1 to 29, and
 - storing or transporting the formulation.

- 31 A sealing means adapted to substantially control skinning of water based or solvent based formulations, in which the sealing means includes an anti-skinning layer, in which the layer is located on at least a portion of the inner surface of the sealing means, wherein the anti-skinning layer, when in use on a container adapted to contain a water-based or solvent based formulation, is capable of retaining a layer of the formulation.
- 32 A sealing means according to claim 31 wherein the anti-skinning layer substantially maintains the water or solvent concentration of any of the water or solvent based formulation retained on the anti-skinning layer.
- 33 A sealing means according to claim 31 or claim 32 in which the anti-skinning layer is textured.
- 34 A sealing means according to any one of claims 31 to 33 in which the anti-skinning layer is porous, fibrous, filamentous, a gauze or foam lining.
- 35 A sealing means according to any one of claims 31 to 34 in which the anti-skinning layer has insulative properties.
- 36 A sealing means according to any one of claims 31 to 35 in which the anti-skinning layer is approximately 0.001 mm to 5 cm thick.
- 37 A sealing means according to any one of claims 31 to 36 in which the anti-skinning layer is integrally moulded or adhered onto the internal surface of the sealing means.

- 38 A sealing means according to any one of claims 31 to 37 in which the anti-skinning layer is thermally bonded onto the internal surface of the sealing means.
- 5 39 A sealing means according to any one of claims 31 to 38 in which the anti-skinning layer covers substantially the entire surface area of the internal surface of the sealing means.
- 10 40 A sealing means according to any one of claims 31 to 39, in which the sealing means is a resealable lid.
- 15 41 A container including a sealing means, in which the container is adapted to contain a formulation prone to skinning wherein at least a portion of the internal surface of the container in proximity with the ullage space of the container has a means capable of retaining a layer of the formulation.
- 20 42 A container according to claim 41 wherein said means substantially maintains the water or solvent concentration of the layer of formulation retained.
- 25 43 A container according to claim 41 or claim 42 in which the means is an anti-skinning layer from 0.001 to 5 mm thick.
- 30 44 A container according to any one of claims 41 to 43 in which the anti-skinning layer substantially covers the internal surface of the sealing means.
- 45 A container according to claim 41 or claim 44 in which the anti-skinning layer is textured.
- 46 A container according to any one of claims 41 to 45 in which the

anti-skinning layer is porous, fibrous, filamentous, a gauze or foam lining.

- 5 47 A container according to any one of claims 41 to 46 in which the anti-skinning layer has insulative properties.
- 48 A container according to any one of claims 41 to 47 in which the anti-skinning layer is integrally moulded or adhered to the internal surface of the sealing means.
- 10 49 A container according to any one of claims 41 to 48, in which the anti-skinning layer is selected from a group consisting of woven or unwoven polyolefin cloth or gauze, artificial grass matting and glass fibre felt.
- 15 50 A container according to claim 49 wherein the layer is thermally bonded to a plastics sealing means.
- 51 A container according to claim 50 wherein the plastics sealing means is a resealable lid.
- 20